THE NEWSPAPER OF INFORMATION SYSTEMS MANAGEMENT
September 14, 1992 · Vol. XXVI · No. 37 · 144 Pages · Section 1 of 2 · $2/Copy · $48/Year

THE MOST EFFECTIVE USERS OF IS
1992 PREMIER 100:

COMPUTERWORLD

Spreadsheet war moves to Windows

Borland, Lotus act to loosen Microsoft's hold

BY CHRISTOPHER LINDQUIST
CW STAFF

LONDON — Users who had been holding their breath waiting for Borland International, Inc. to release a Windows application can finally get some air following last week's debut of Quattro Pro for Windows.

The long-awaited and much-discussed spreadsheet will compete with Lotus Development Corp. and Microsoft Corp. in what has become a bloody struggle for the hearts and wallets of graphically inclined users.

"I think we're finally going to see the real battle take place," said Jesse Berst, publisher of the "Windows Watcher" newsletter in Redmond, Wash. Borland will have its work cut out for it as it tries to convince users that it will be able to upgrade the product on schedule after the long delay in delivery, he said.

Lotus will not be resting on its laurels, either. "Lotus has said

Continued on page 20

NEW PRODUCT IN-SITE — PRODUCT EVALUATION

Oracle 7

Beta-test users rate the latest release of Oracle's RDBMS high on quality but short on affordability and simplicity. See New Product In-Site, page 96.

Enhancements/ New features	4.7
Ease of installation	4.0
Ease of use	3.7
Purchase/ Maintenance cost	2.8

Ratings are based on a scale of 1 to 5, where 1 is below expectations and 5 is above expectations

High-tech movie highlights realistic security concerns

BY JAMES DALY
CW STAFF

It is a rare — or perhaps daydreaming — information systems director who would compare himself with Robert Redford. But a new high-tech crime movie in which Redford stars may have computer executives debating not only the worth of a government-sanctioned encrypting standard but also the extent to which any data can be considered truly safe or trusted.

In *Sneakers*, a brilliant mathematician invents a small, black-box code breaker that allows its users to decrypt the most sophisticated encoded information instantly and gain access to any computer system.

In the movie's gee-whiz sequence, Redford's pals test the gizmo and drop their jaws in wonder as the Federal Reserve's computers, the air traffic control system and a "national power grid" all lie open for them to study — or modify.

Sneakers relies on a vintage Hollywood formula of supersleuths covertly deciphering encoded messages. If taken to an extreme, it is liable to add fuel to the arguments already roaring about the depth of safety provided by the Data Encryption Standard, a government-approved algorithm for encrypting digital information. The algorithm is up for recertification next year.

"The basic premise of [*Sneakers*] is very, very far-fetched, but it does remind us

Continued on page 16

IBM to users: 'It'll cost you'

Free on-site support is now shared or billed

BY JOHANNA AMBROSIO
CW STAFF

ARMONK, N.Y. — IBM, the company that built its business on excellent technical support, is changing the rules of the game. More customers must make do with telephone support instead of the free on-site technicians who used to be part of most big-iron deals.

There are still technicians available for on-site service. But where there had been service people dedicated to a particular large account, some customers now share technicians among multiple sites. And some users must pay an hourly rate of up to $200 for an expert's time, although an IBM executive acknowledged that some freebies are still being offered in certain circumstances.

Many customers are philosophical about this change, saying they have been expecting it for some time. "We [users] have been very successful at getting IBM to reduce the cost of hardware and still get the benefit of bundled services," said William Dean, director of technology management services at Pepsico, Inc. in Purchase, N.Y.

Continued on page 14

Retailer nears end of huge IS overhaul

JC Penney restructuring may save $11M yearly

BY ELISABETH HORWITT
CW STAFF

DALLAS — It will be "lights-out" at JC Penney Co.'s four data centers next year. The nationwide retailer last week announced plans to control and manage its operations from a single production control center here.

Headed by JC Penney's director of information systems, David Evans, the move has a bottom-line expected savings of $11 million annually in computer operations, coming in part from the elimination of 300 IS positions, the retail giant said.

The restructuring is the final, "cost-reduction and optimization phase" of a multiyear data center consolidation that has brought the company down from approximately 20 centers in the late 1970s to four today, Evans said.

The consolidation, which has been paralleled by recent corporate cost-cutting, furthers JC Penney's commitment to being a "low-cost producer in our industry," Evans said.

JC Penney is "effecting a logical [IS] operation rather than a physical operation, leaving hardware in its existing locations. Operating activities will be relocated to a centralized production control center" that will be the company's "computing model for the 90s," said John Dratch, manager of data processing and technical support.

Sam Ogozalek

Evans *leads JC Penney's consolidation*

Scheduled for completion by the end of next year, the new

Continued on page 12

Pleasure and pain

More work. More stress. And — surprise — more satisfaction.

Nearly 70% of the respondents in *Computerworld*'s Sixth Annual Job Satisfaction Survey say they are doing more work this year compared with last.

Yet despite rising work pressures, especially among nonmanagers, the number of people who say they are more satisfied than last year with their jobs actually rose 8%. Greater challenges and growth opportunities were often cited as reasons for satisfaction.

But trouble might be looming: Rank-and-file information systems workers voice growing criticism about their work and departments.

And the number of IS managers and professionals who say they are less satisfied with their jobs climbed about 6%.

Complete survey results and profiles begin on page 99.

INSIDE

Tools previews and the delivery date of Oracle's next-generation database await attendees of this week's Oracle user meeting. Page 4.

Two utilities tap systems integrators to automate, innovate and lower costs. Page 6.

Price-sensitive PC users assess new entries from IBM and Apple. Page 8.

Is the threat of computer viruses exaggerated? Page 16.

NEWSPAPER
$630##################### 5-DIGIT 48103
$UIV7ZE300M0990398 0010109266
UNIVERSITY MICROFILMS INT 0871
UNIVERSITY MICROFILMS INT
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48103
SECOND CLASS

IN THIS ISSUE

NEWS

4 Naturally, **Oracle** users are interested in Oracle 7, but they are even more concerned about whether it will be delivered on time.

6 **Microsoft**'s release of Windows for Workgroups could give network computing a big boost.

8 First-time home users are the target of **Apple**'s Performa line of PCs.

10 An early user of **Lotus**' Notes imaging companion finds it both capable and inexpensive.

12 A slew of products from **IBM** will make it easier for LAN users to integrate with existing products.

14 Five corporations file complaints with the FCC accusing **AT&T** of charging exorbitant network fees.

15 **P1 Systems** introduces the least expensive entry to date in the notepad-size pen-based market.

16 An IBM virus researcher addresses such issues as how widespread are viruses, and are they controllable?

24 **Zenith Data** wins a huge contract to supply 300,000 PCs and peripherals to defense and civilian agencies.

Quotable

"If a man made the DES, a man can break it."

IAN MURPHY
IAM/SECURE DATA SYSTEMS

On the worth and security of a government encryption standard. See story page 1.

DESKTOP COMPUTING

35 Powerful notebook computers will be ripe for the picking this fall.

WORKGROUP COMPUTING

59 How to follow up a successful downsizing project.

ENTERPRISE NETWORKING

67 A group of users and vendors creates a blueprint for networking products and standards.

LARGE SYSTEMS

79 **UPS**' package-tracking system enables quick replies to customer queries.

APPLICATION DEVELOPMENT

87 Visix hopes users will find its **Galaxy** environment out of this world.

96 **New Product In-Site:** Oracle 7 beta-test users praise its quality but struggle with its complexity.

MANAGER'S JOURNAL

109 Meeting-support software can cut meeting time by one-tenth.

EXECUTIVE REPORT

99 The pain and the pleasure of life in IS: Our Sixth Annual Job Satisfaction Survey.

IN DEPTH

105 Electronic forms shine when linked to database and data collection technologies.

DEPARTMENTS

6, 16 News Shorts
28 Advanced Technology
32 Editorial
111 Calendar
115 Computer Careers
117 Fast Track
123 Marketplace
128 Stocks
129 Computer Industry
130 Inside Lines

The 5th Wave

"...and hey - what about the names of some of these companies - 'Peachtree', 'Apple' - what are we supposed to do, program these things or peel them? I don't know if these things go on a desk or in a bowl."

EXECUTIVE BRIEFING

■ **IBM is tweaking its tradition of intensive technical support for big-iron customers,** many of which must make do with fewer on-site IBM technicians, more telephone support and hourly charges of $200 for expert advice. While some customers view the changes as inevitable, others are upset at having to hire more technical staffers. **Page 1.**

■ **IS managers and professionals are working more and stressing out more.** Still, overall job satisfaction rose modestly among those surveyed for *Computerworld*'s Sixth Annual Job Satisfaction Survey. 'Increased challenges' were cited as a big factor. **Page 99.**

■ **JC Penney's four data centers** will go into remote operations mode next year and are expected to save the company $11 million annually. **Page 1.**

■ **Washington Water Power outsources** its information systems power to Electronic Data Systems, and Connecticut Natural Gas signs Andersen Consulting as systems integrator — two more chapters in the ongoing saga of price-squeezed utilities in search of innovative technology partnerships. **Page 6.**

■ **Gray areas in network service contracts** surfacing in a Federal Communications Commission complaint against AT&T could cause network managers to reexamine where their responsibilities end and their service provider's begin. **Page 14.**

■ **A consortium of users, vendors and standards organizations** offers a treatise on how today's morass of network management products and standards can peacefully coexist and interoperate. **Page 67.**

■ **Going from paper to electronic forms can save companies about 73% in costs.** But saving money isn't the real benefit of forms automation. Through use of workgroup automation and client/server connectivity, companies such as KFC Corp. are improving the quality and efficiency of their operations because users get a palatable interface to enterprise data. **Page 105.**

■ **Oracle users are looking for signs of a re-energized vendor in this week's** previews of enhanced products and concrete shipping dates for the Oracle 7 relational database management system. **Page 4.**

■ **Open tools that can generate** vendor-independent application code can simplify matters for sites with multiple databases. **Page 87.**

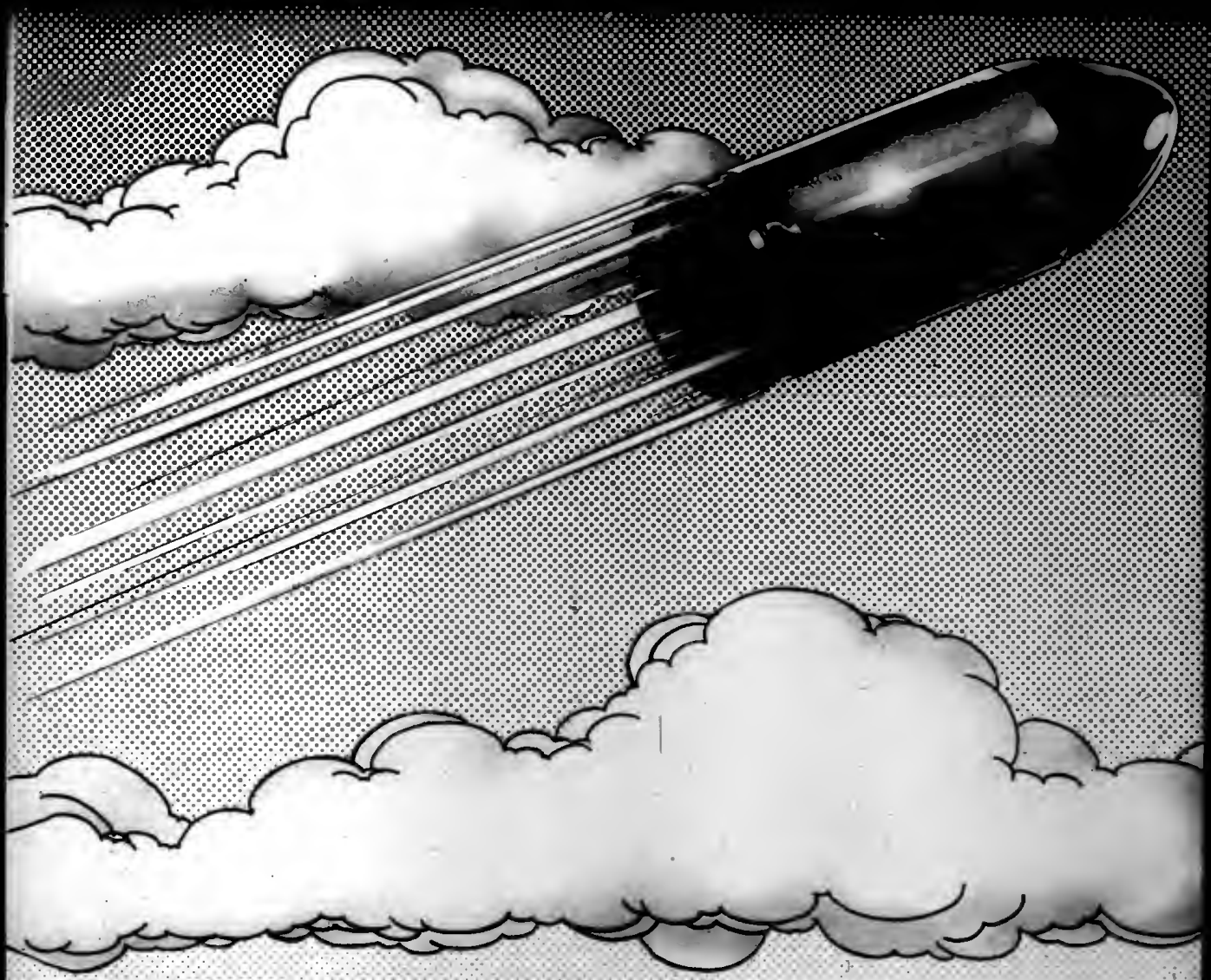
■ **Apple is unveiling four entry-level models** for the home market in the company's first large-scale attempt to sell through the IBM-dominated mass market retail channel. IBM, meanwhile, is rolling out a revamped line of Personal System/1 PCs. **Page 8.**

■ **Hewlett-Packard takes a divide-and-conquer strategy** for marketing the Microsoft Windows and Unix versions of OpenView to different network management niches. **Page 67.** Another division of HP is using gentler methods to convince its 100,000-plus base of Apollo/Domain workstation users to stay inside the fold. **Page 62.**

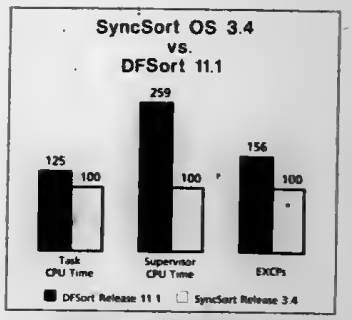
■ **Modeling the behavior of a fire could lead to safer data centers** and improvements in other buildings. **Page 28.**

■ **Legent extends its mainframe offerings** to the desktop. Users follow but not all in a rush. **Page 79.**

■ **On site this week:** Ben & Jerry's supports Deming management processes using videoconferencing technology. **Page 67.** UPS installs one of the largest DB2 databases in the country to confirm delivery of more than 13 million packages each day. **Page 79.** An automated program trading system has enabled market maker Rockrimmon Securities to double its trading volume within the past year. **Page 38**



SYNCSORT CAN'T LEAP TALL BUILDINGS, BUT IT IS FASTER THAN A SPEEDING YOU-KNOW-WHAT.



syncsort

201-930-8200

©1992 Syncsort Incorporated

CC:Mail yanks Unix desktops onto the net

BY JOANIE M. WEXLER
CW STAFF

MOUNTAIN VIEW, Calif. — User enthusiasm for a Unix version of Lotus Development Corp.'s CC:Mail electronic-mail package, which is slated to roll out today, is in step with industry reports that Unix systems sales are largely outpacing overall hardware growth.

The Unix-based CC:Mail runs on a Sun Microsystems, Inc. Scalable Processor Architecture/Solaris platform with an Open Look interface. Additional versions for Hewlett-Packard Co. and IBM workstations with Motif interfaces should arrive during the first half of 1993, said Atta Rasekhi, product manager of CC:Mail Unix products.

The foray into Unix for traditional personal computer local-area network-based mail packages addresses two trends, said users and analysts: the proliferation of Unix on corporate desktops and corporate efforts to fuse mail packages on all their computing platforms into one interactive messaging backbone.

International Data Corp. in Framingham, Mass., has reported that the worldwide Unix systems market grew nearly 19% in 1991 in an overall hardware market that grew just 2%. The firm said Unix desktops made up 79% of the 900,000 Unix-based system shipments last year.

CC:Mail for Unix beta-test site Raychem Corp. in Menlo Park, Calif., for example, is about one year into a project to create a corporatewide "data bus," which will allow users anywhere in the multinational company to access data anywhere, regardless of platform.

Part of the initiative includes E-mail exchange, said Frank Pleshe, network engineer at the conglomerate.

Pleshe and others said the main attraction of the package is that Unix populations gain entry into the messaging network while retaining the look and feel of the operating system in which users are versed.

For example, prior to the Unix beta test, Raychem was able to exchange multiplatform CC:Mail messages through Novell, Inc. NetWare file servers running NetWare NFS software. But SPARCstation users were faced with a DOS interface.

"They were frustrated; they lost a lot of the point-and-click functionality they had with the Sun operating system," Pleshe said.

"You want to keep the interface consistent with the platform" so users can leverage the operating system they are skilled in, agreed Nina Burns, president of market development services at Creative Networks, Inc. in Menlo Park, Calif.

She explained that this ability of CC:Mail is s result of the vendor writing applications specifically for each platform rather than porting DOS-based software to other environments.

CC:Mail shop Southern California Edison in San Clemente, Calif., however, has avoided putting much Unix on its desktops "because they couldn't play in our E-mail environment," said Bill Lawrence, network engineer. But the utility does run myriad Unix server processes that "would run a lot better if errors could be detected and E-mailed to somebody," Lawrence said. "Unix is architected to allow most processes, such as overnight tape backup systems, to communicate via its mail systems."

Rasekhi said CC:Mail will provide this capability in the second half of 1993.

CC:Mail's Unix client will allow Unix communities to exchange mail and mail-enabled documents with CC:Mail users on DOS, Microsoft Corp.'s Windows, Apple Computer, Inc. Macintosh and OS/2 platforms.

"This is a savvy move because when you integrate two [different] mail systems, you lose robust functionality," said Walter Ulrich, a director in the Los Angeles office of Arthur D. Little. Observers said they are not aware of any other LAN mail vendors with Unix clients today.

Riding the wave

The Unix version of CC:Mail aims primarily to connect Unix desktops growing at a 13.7% annual clip

Source: Computer Intelligence/InfoCorp
CW Chart: Janell Genovese

Oracle conference goers look for proof of change

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — Users attending the International Oracle Users Group (IOUG) meeting this week expect to see tangible proof of a reenergized Oracle Corp. through previews of enhanced products and delivery of a concrete shipment schedule for the Oracle 7 relational database.

For all the hoopla that preceded Oracle 7's introduction on June 15, its exact shipment date — expected this fall — may not be as important as Oracle's sticking to any date it promises, analysts said. That is because the 1989 introduction of Oracle 6.0 took a year to play out to more than 80 hardware platforms.

"It will take a while to migrate from Oracle Version 6.0 to Oracle 7, even if users got it today," said Charles Phillips, a vice president at SoundView Financial/Gartner Group, Inc. in Stamford, Conn. "They're going to have to shake it down themselves to make sure it's robust and reliable before putting it into production."

Oracle's financial problems stemmed from 1990, when expenses outstripped revenue at the firm. Oracle reorganized its sales divisions and laid off 500 employees but sustained a $12.4 million loss for the year ending in May 1991. A month later, Oracle won $200 million in new financing from Nippon Steel Corp. and was profitable for the year ending in May 1992.

Oracle also patched up frayed user confidence by addressing quality and support issues in 1991. The fruits of this labor seem to be borne out by users' initial reaction to Version 7 (see story page 96).

New division unveiled

Also at the conference, an estimated 4,000 users will learn of a new North American division of the IOUG. IOUG will be transformed into an umbrella organization for European, North American and Pacific Rim user groups.

"It will reduce the need for the IOUG president to deal with 26 regions throughout the world and with hundreds of local groups," explained Jim Raper, IOUG board member from the Southeast Region.

Many users questioned last week said their major reason for attending IOUG this year was to see previews of a new generation of graphically oriented Oracle tools: SQLForms 4.0, which is reportedly not yet ready for testing; and SQLReportWriter 2.0, a report-creation tool that sources said entered beta testing last month.

The enhanced Oracle tools depend on Toolkit 2.0, a new software layer that supports multimedia applications due for introduction in late 1992 or early 1993. But users are concerned about the amount of memory and system overhead the feature-rich Toolkit 2.0 will require.

Oracle "is extremely proud of its designer interface," said Michael Abbey, chairman of the Affinity group, an advisory group of top Oracle users. "It's like having a Chevrolet that has solid gold doors. You can start it, it's very, very pretty, but if you put it in production, everybody may start twiddling their thumbs while they wait."

Other IOUG show highlights, analysts said, might include information aboot additions to Oracle's team of top executives, exhibits of massively parallel relational database management systems and s showing of Microsoft Corp.'s Excel spreadsheet acting as a front end to Oracle databases running under Microsoft's Windows New Technology operating platform.

Industry analysts speculated that Oracle founder and Chief Executive Officer Lawrence Ellison may be ready to shed one of his three titles — chairman, president and CEO — to an experienced outsider or to one of his top lieutenants by year's end. Oracle recently hired a number of notable industry executives.

If Ellison takes a half-step back from the helm of the RDBMS market leader he founded 13 years ago, it may be a delayed response to 1990's troubles, analysts said. "He's just going to give these [top] guys more leeway in running the store," said Rick Sherlund, vice president of investment research at Goldman, Sachs & Co., a New York investment house.

Sybase reaffirms SQR support

Attendees at this week's IOUG meeting will learn they can count on continued support for the popular SQR report writer product from an unlikely source — Oracle competitor Sybase, Inc.

Users were upset this summer by rumors claiming that Sybase would halt SQR support for the Oracle database.

But in a letter to more than 700 SQR sites, Sybase promised to continue support for SQR, an independent fourth-generation language product used by Oracle sites worldwide as an alternative to Oracle's SQLReportWriter 1.0. Future SQR support will be discussed st Oracle user meetings this week, said Matt Reagan, president of the SQR user group at IOUG.

Sybase's letter, dated Aug. 17, was obtained by *Computerworld* last week. It reads, in part: "In keeping with its open systems approach, Sybase will continue to sell and support the SQL Solutions [Division] products that interface to non-Sybase databases such as Oracle, Informix, Ingres, [DEC's] Rdb and [Gupta Technology, Inc.'s] SQLBase." It stopped short of promising to enhance SQR for Oracle 7.

Some users said they were told by Sybase personnel last summer that modules for the non-Sybase databases would be downplayed in favor of support for the Sybase relational database management system. The rumors spread among Oracle users shortly after Sybase acquired Cleveland-based SQ Software, Inc., which created SQR.

"The seed may have been a misunderstanding, but it built its own critical mass," Sybase product manager Steve Hershberg confirmed.

Greg Olson, vice president of strategic planning, who wrote the Sybase letter to SQR users, said he plans to enhance SQR for Oracle 7. But he alleged that Oracle canceled the Oracle 6.0 license of Sybase's SQL Solutions Division when the unit was absorbed by Sybase last spring. "That has thrown a monkey wrench into our plans," he said. "We negotiated with Oracle to keep our license until the end of this year."

Sybase executives declined to point fingers at the source of the rumors. Some users claimed that Sybase sales personnel were to blame for informally indicating a bias. "I think there has been a fair amount of concern," said M. J. Kahn, SQR product manager based at Sybase's Burlington, Mass., office. "People felt this black cloud hanging over them."

JEAN S. BOZMAN

Attention All dBASE Users: Your Windows Have Arrived.

Introducing new dBFast.™ The first and only dBASE™ compatible database and dBASE/X-Base language for Windows. It's the fastest, smartest and easiest way for millions of users and developers to join the Windows revolution.

Graphical, colorful dBFast will bring new life to all of your existing dBASE programs.

Liven them up with multiple, movable windows, pull-down menus, check boxes, dialog boxes, radio buttons, push buttons and bitmap pictures.

dBFast also helps you create new dBASE programs quickly and easily.

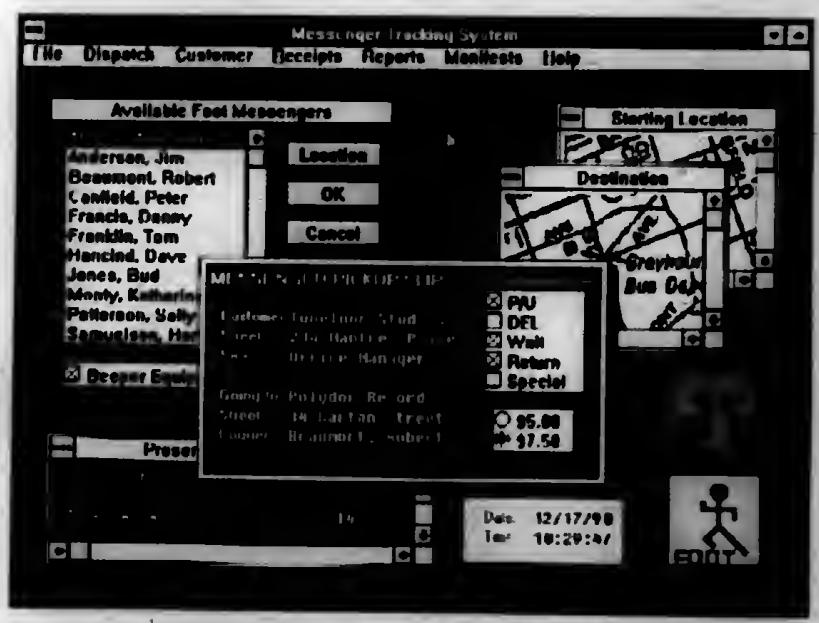
Unlike other Windows development systems that force you to learn a new language, dBFast allows dBASE, Fox and Clipper developers to use the language they already know with more than 200 extensions and an interactive editor, compiler and linker.

And full industry standard DDE and DLL protocols allow your programs to communicate with other Windows applications.

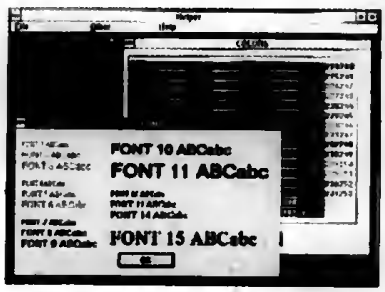
So call 1-800-CALL CAI and we'll rush you a free Demo Disk.

Call right now.

After all, haven't you waited long enough?



dBFast helps you create powerful, graphical database applications quickly and easily with pull-down menus, check boxes, radio buttons and even bitmap images.



Your applications will really come to life with multiple colors and fonts.

Free

COMPUTER ASSOCIATES
Software superior by design.

dBFast™

© Computer Associates International, Inc., 1 Computer Associates Plaza, Islandia NY 11788-7000. All trade names referenced herein are trademarks of their respective companies. dBASE is a registered trademark of Ashton-Tate Corporation.

NEWS SHORTS

Roadway Express nabs SIM award

A series of information systems initiatives that bucked Akron, Ohio-based Roadway Express up to what it claims is the top spot among the nation's less-than-truckload motor carriers has also earned the firm a Society for Information Management (SIM) 1992 Partners in Leadership award. Roadway Express President Michael Wickham and IS Vice President Gerald Long will share honors at SIM's annual conference next month for the likes of E-Z Bill, a personal computer-based shipment data management system given to customers so they can build databases, print shipping documents, transmit bills of lading and calculate freight rates.

Bellcore branches into auditing

Bellcore, the research and development arm of the regional telephone holding companies, last week said it has begun offering technical auditing services directly to network equipment suppliers for Switched Multimegabit Data Service and frame-relay offerings. Previously, Bellcore provided the services for one of its seven phone company owners. Bellcore tests vendor products for compliance with industry standards or Bellcore generic requirements.

DEC expands Polycenter suite

Following two years' development effort, Digital Equipment Corp. and System Center, Inc. brought out products that are said to enable users to manage DEC and IBM networks from either vendor's network management system [CW, Sept. 7]. Announced at last week's European DEC Users Society, DEC's Polycenter SNA Manager Version 1.0 and System Center Solve:Connect for EMA are said to provide peer-to-peer links between DECmcc Director and either IBM's Netview or System Center's Net/Master SNA management system. The products are scheduled for availability by December, DEC said. Polycenter SNA Manager will be priced at around $15,000; Solve:Connect will cost $50,000 for IBM MVS-type systems.

EDS buys stake in software vendor

Electronic Data Systems Corp. has wielded the equity weapon in its campaign to replace Computer Associates International, Inc. mainframe software with other brands [CW, Aug. 3]. The Dallas-based outsourcer has invested $2 million in a small Israeli mainframe firm, 4th Dimension Software Ltd. in Tel Aviv.

Sun wins CBOT bid

The Chicago Board of Trade (CBOT), known for the public auction, "open outcry" market system conducted in its trading pits, settled last week on Sun Microsystems, Inc. SPARCstations and servers as the base for a new technology installation dubbed "Project A." The project will expand trading opportunities for CBOT's 3,600 members by offering new niche trading, such as scrap steel futures contracts, via high-resolution graphical windows opened on the SPARCstation screen.

Fujitsu supercomputer aimed at U.S.

San Jose, Calif.-based Fujitsu America, Inc. said last week that it would market a brand-new Fujitsu Ltd. supercomputer. The VPP500 offers 11.2 billion floating-point operations per second (GFLOPS) to 355 GFLOPS of performance for prices ranging from $9.5 million to $120 million. It will be available in September 1993.

Short takes

Texas Instruments, Inc. plans to unveil today Business Design Facility, a business re-engineering workbench. . . . **Visa U.S.A., Intuit** in Menlo Park, Calif., and Primerica Corp.'s **Primerica Bank** announced IntelliCharge, a service that gives consumers PC-based tracking of their credit card spending. . . . **Dell Computer Corp.** has taken up the pruning shears yet again, snipping $100 off the prices of its 486D/25 and 486P/25 systems. Pricing now ranges from $1,899 to $2,499 for the models.

More news shorts on page 16

Utilities partner way to IS power

BY NELL MARGOLIS
CW STAFF

HARTFORD, Conn. — Two regional power suppliers last week added their names to the growing list of utilities relying on information technology to stay their bottom lines while spreading their customer services.

Nine months into a sweeping migration to a client/server-based automated customer information system, Connecticut Natural Gas Corp. paused to formally confirm Chicago-based Andersen Consulting as its software vendor and systems integrator of choice.

Neither company was willing to divulge the contract price, but a Connecticut Natural Gas executive estimated the overall project cost at $10 million to $15 million.

Meanwhile, in Spokane, Washington Water Power Co. outsourced its 45-person IS operations to Dallas-based Electronic Data Systems Corp. The utility signed on for 10 years' worth of data processing, application development, system maintenance and system center support from the outsourcer.

Washington Water provides water, gas and electricity to an aggregate 418,000 customers in Washington, Oregon and Idaho.

Terms of the deal were not disclosed. However, Merrill Lynch & Co. analyst Stephen T. McClellan placed the contract among several that EDS will announce in the next few days, "all in the $50 million to $100 million ballpark."

All 45 members of the Washington Water IS crew were offered jobs at EDS, according to Washington Water spokesman Patrick Lynch; all but one, he added, have accepted. Former Washington Water IS manager Tony Broyles will remain at the utility, where he will head up a new seven-person IS oversight department and "will manage the EDS relationship," Lynch added.

Technology catch-22

Utility companies are struggling under common — and crippling — constraints, noted both Lynch and Connecticut Natural Gas information services director Russell Leavitt Jr. Since information technology lies at the heart of their ability to serve customers, the utilities were early to automate. That means that today, most are stuck with albatross-like "legacy" systems that cost the moon to keep up and more to replace.

Washington Water opted for outsourcing when the prospect of "upgrading and the replacement cost of our mainframe — a basically obsolete IBM model — sent shivers down our spine," Lynch said.

The same bind that sent Washington Water's IS group in search of an outside contractor turned Connecticut Natural Gas' sights inward, triggering a several-year trek from a Unisys Corp. mainframe-based customer information system to a split mainframe/client/server approach featuring customized host-based Andersen software and IBM workstations, Leavitt said.

The project is expected to go live in stages between February and October 1993. Andersen will install, integrate and customize to Connecticut Natural Gas' particular demands the powers of two utility-specific Andersen applications.

These include Customer/1, a customer information system that supports all customer contact and billing jobs and is being tailored to incorporate new marketing and meter/equipment inventory subsystems for Connecticut Natural Gas; and Work/1, a project management package that automates tasks such as standards-based estimating, field reporting, capacity-based scheduling and leak management.

Part of Andersen's challenge as systems integrator for the ambitious project will be a first: tightly integrating the two packages to share a DB2 database and provide users throughout Connecticut Natural Gas with common views of all information. The plum contract was won over bids from contenders, including IBM and Price Waterhouse.

The gas company is expecting to mine rich rewards from its investment by way of tightened financial controls and expanded service offerings, Leavitt said.

Windows for Workgroups in use at beta-test sites

BY CHRISTOPHER LINDQUIST
CW STAFF

REDMOND, Wash. — Microsoft Corp. has announced that Windows for Workgroups, its peer-to-peer network-enabled version of the Windows environment, has entered beta testing at 8,000 sites.

Windows for Workgroups reportedly enables users to connect Windows workstations into a peer-to-peer network that allows file and printer sharing without the need for a separate network operating system. The product will also ship with versions of Microsoft Mail electronic mail and Schedule+ group scheduling software.

One beta-test user, who asked to remain anonymous, said the product could greatly increase the acceptance of network and workgroup computing.

He indicated two examples of where the product fit easily, one being a department that needed networking but was waiting for security clearance to join the corporate network. The other was an office with a few personal computers but even fewer printers. Windows for Workgroups would be an answer in both situations, he said.

The user also indicated that Microsoft may sweeten the deal for users new to networking by bundling a network card with the software. He said the transition to Windows for Workgroups is "almost completely transparent," requiring only knowledge of network versions of the File Manager, Dynamic Data Exchange and the Clipboard.

He noted a small network of three nodes could easily be set up in a of couple hours, including installing the cards and running cable.

However, the product is not groupware per se. The user indicated that Windows for Workgroups is not going to compete with such products as Lotus Development Corp.'s Notes. Instead, he compared its use with an Apple Computer, Inc. Macintosh's peer networking capabilities but said it was better. "They're doing everything that Apple did wrong, right."

Windows for Workgroups is scheduled to ship by the first quarter of next year.

CORRECTIONS

Because of a reporting error, the ship date for the IBM Application System/400 Model E95 four-way processor was listed incorrectly in "AS/400 users zero in on pricing" [CW, Sept. 7]. IBM plans to ship the machine this month.

The article "DEC covers client/server bases," [CW, June 15] quoted a customer stating that Interconnections, Inc.'s NetWare for VMS does not allow VAX users to access printers on the personal computer local-area network. NetWare for VMS is part of a family called Leverage for NetWare. It can be integrated with another member of the family, Network Print Services, which allows VAX users to print files on NetWare printers, Interconnections said.

LOOK WHO'S COOPERATING ON A COOPERATIVE-SERVER DATABASE

"Oracle's always been the leader in building database technology. One of the great things about Oracle's approach is that they're hiding the differences between all the machines out on the network running on various platforms."

Bill Gates
Chairman and CEO
Microsoft Corporation

"ORACLE7's breakthrough in hiding technological complexity is analogous to the ease-of-use breakthroughs accomplished by the introduction of the Mac in 1984."

John Sculley
Chairman and CEO
Apple Computer, Inc.

"The fundamental problem with early client-server database management systems is that applications cannot access data on more than one server without a lot of extra programming. This programmatic approach to accessing data on multiple servers is in stark contrast to the totally automatic approach provided by ORACLE7."

Larry Ellison
President and CEO
Oracle Corporation

"With HP systems and ORACLE7, our customers will have the desktop to high-end performance they need for a fraction of the cost of mainframe computing solutions."

John Young
President and CEO
Hewlett-Packard Company

"ORACLE7 is really solving the complexities of the distributed computing environment cost-effectively. Plus, it supplies the reliability and security that are required in a distributed computing environment. In fact, because ORACLE7 matches Sun's client-server model so well, we have chosen ORACLE7 as one of our key databases."

Scott G. McNealy
President, CEO and Chairman
Sun Microsystems, Inc.

The world's largest database company introduces a revolutionary new technology called a cooperative-server database. A cooperative-server database hides the complexity of computer networks by enabling applications to access data located on multiple computers just as if all the data were stored on a single computer. In this way, a cooperative-server database simplifies application building and improves decision making by making access to information easier. . . much easier.

ORACLE®

Software that runs on all your computers.

For more on ORACLE7, just call 1-800-633-1071 Ext. 8184. Find out what these industry leaders are excited about.

© 1992 Oracle Corporation. ORACLE and ORACLE7 are registered trademarks of Oracle Corporation. Call for product, service, and seminar information. In Ontario or Quebec call 1-800-263-8072, elsewhere in Canada call 1-800-263-8069.

IBM muscles PC pricing down

But new PS/1s, impending ValuePoint line could eat into PS/2 sales

BY CAROL HILDEBRAND
CW STAFF

NEW YORK — IBM Personal Computer Co.'s unleashing of a fully revamped Personal System/1 line has some analysts predicting that the PS/2 line will lose sales to its mass market sibling, but most forecast that the real product line overlap will come with the advent of the ValuePoint line.

The new PS/1s are divided into three different lines, each targeted at a particular segment of mass merchandisers and each containing different bundled software that IBM said targeted the type of customer that frequents each kind of store.

There were no suggested retail prices, although IBM said pricing would probably range from $1,100 to $2,800 and that retailing competition could drive prices lower.

Robert Corrigan, president of IBM Personal Computer, said some cannibalization between IBM's new and existing products was possible, but he would rather see it staying among IBM families than moving toward a competitor.

"It would have happened anyway, but before, they would have moved to somebody else's product," he said. "Now we'll have an offering in all places."

Analysts called the PS/1 pricing very competitive, particularly in light of its standard configuration (see chart). "I didn't expect anything close to this," said Kimball Brown, an analyst at International Data Corp. in Mountain View, Calif.

Corporate appeal

Some analysts said there could be corporate interest in the lines, which are expandable and sport Intel Corp. 486DX-based models, if they follow the example of Compaq Computer Corp.'s ProLinea series. But, most said the true cannibalization of the PS/2 line will come at the end of next month, when IBM said it will announce its low-cost ValuePoint line, the midrange line in IBM's three-family strategy.

"When you're really going to see cannibalization is [during delivery of the ValuePoint line] coming in October," Forrester Research, Inc. analyst William Bluestein said. "Obviously, the most critical market is the corporate market, and it remains to be seen whether they can get their prices down for that."

However, Karlyn Gale, an analyst at Technology Investment Strategies Corp., said she could see this line appealing to midsize corporations as well as to its planned targets, the small businesses and home users.

According to Corrigan, it is a matter of time before the company starts a direct response, or direct mail, campaign, reportedly for its forthcoming ValuePoint line.

Jerry Jobin, an analyst at Loyola University in Chicago, is one PC buyer who sometimes frequents superstores. But, he said, the PS/1 is not on the university's accepted list of standards, so he doubted he would purchase one.

"I haven't looked at PS/1s at all. But I'm sure if I see it in Sears, etc., I'll stop by and fiddle with it."

IBM's PS/1 onslaught is divided into these lines:

• **PS/1 Essential.** Targeted at small-business owners who typically shop at office supply stores, the Essential is available at Office Depot, Inc., Office Max and Staples, Inc. The bonus software includes accounting package QuickBooks and Express Publisher.

• **PS/1 Expert.** Sold through superstores such as Computer City, ElecTek and BizMart, Inc., the Expert line is aimed at a fairly computer-savvy user. Added software includes Address Book Plus and Calendar Creator Plus.

• **PS/1 Consultant.** For the home user who shops at stores such as Sears, Roebuck and Co., Montgomery Ward & Co. and Circuit City Stores, Inc., the Consultant line is sold with financial management package Quicken for Windows and the New Print Shop.

Analysts differed on the question of whether IBM has segmented the market too severely.

"I believe IBM is correct on the segmenting. They may have a crossover, but you do not have the same kind of customer shopping at those kinds of stores," said JoeAnn Stahel, president of Stahel & Co. in Plano, Texas.

But Sy Merrin, editor of "The Channelmarker Letter" newsletter in Palo Alto, Calif., disagreed. "One of the things IBM is trying to do which will not be successful is trying to force segmentation on dealers that doesn't work," he said.

Head to head

IBM and Compaq are both looking to appeal to small businesses and home users

	Compaq ProLinea	IBM PS/1
CPU	25 MHz 386SX	25 MHz 386SX
RAM	2M bytes	2M bytes
Drive	40M bytes	85M bytes
Mouse	Yes	Yes
Modem	No	Internal 2,400 bit/sec.
Software	DOS 5.0 Windows 3.1 PFS: Windowsworks	DOS 5.0 Windows 3.1 Works for Windows Prodigy Promenade Address book
Monitor	No	No
Price:	$899	Set by retailer

CW Chart: Janell Genovese

Apple fights clones with low-end Macintoshes

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. will launch the first shot in a two-punch fall Macintosh product introduction cycle today when it unveils four entry-level models that it hopes will sell briskly to the home market.

The four-member Performa series includes the first Macintosh with a preinstalled compact disc/read-only memory (CD-ROM) drive as well as the company's first large-scale attempt to sell through the mass market retail channel now ruled by IBM-compatible personal computers.

The Performa 200, 400, 600 and 600 CD will be sold at 1,800 outlets, such as Sears, Roebuck and Co., Office Max, Silo, Inc. and Office Depot, Inc., although the two high-end models will not be on the shelves until next month.

Close to home

Apple Vice President Keith Fox said the machines will generally not be available in the business-oriented computer stores such as Businessland, Inc. and Computerland Corp. because they are targeted at home buyers.

Given the target audience, Apple is including a year's worth of service and support as well as preinstalling integrated applications such as Claris Corp.'s Clarisworks or Symantec Corp.'s Greatworks.

An enhanced System 7 operating system that will be offered with the series includes additions that make the launching, navigation and backup of applications easier. Even window dressing such as making the machines boot up in color will be included. "Usually when people see the machine boot up in black and white, that's the first call to the support lines," Fox said.

Although the machines are specifically targeted at first-time buyers for the home, their low price might make them attractive to corporate IS buyers as well. But their lack of expandability in comparison to higher end Macintoshes may make the price issue relatively unimportant.

"Besides, we already get massive discounts when we buy directly from Apple, so we don't need to jump in the car and drive down to Sears to get a good price," said Rob McPhee, development engineer at the DuPont Imaging Systems Department of Du Pont Co. in Wilmington, Del.

Analysts said they thought Apple had a good chance of succeeding in the same lucrative mass market chains where IBM-compatible machines are now thriving.

"The key to these machines is the channels they will be sold through," said Tim Bajarin, an analyst at Creative Strategies Research International, Inc. in Santa Clara, Calif.

The Performa models are essentially redesigned versions of the Macintosh Classic II, the LC II and the Macintosh IISI. On Oct. 19, the vintage IICI and IISI will be replaced, respectively, with the 16-MHz 68030-based Macintosh IIVI, which is expected to sell for about $2,300, and the 33-MHz Macintosh IIVX, which will offer an optional internal CD-ROM drive and sell for about $2,800.

Apple will also release two new PowerBooks on that date: the high-end 33-MHz Model 180 and the 25-MHz Model 160. Both are expected to sell for between $2,100 and $2,600.

Apple estimates the machines could pique the interest of as many as 7 million potential new buyers.

Sliced apple

The Macintosh Performa line is aimed at price-sensitive users

	200	400	600
Processor	68030	68030	68030
Memory	4M bytes	4M bytes	4M/5M* bytes
Slots	None	1 PDS	3 Nubus
Mass storage	3 1/2-inch, 1.44M-byte floppy, 80M-byte hard drive	3 1/2-inch, 1.44M-byte floppy, 80M-byte hard drive	3 1/2 inch, 1.44M-byte floppy, 160M-byte hard drive, optional CD-ROM
Expected list price	$1,250	$1,450	$2,000 ($500 optional CD)
Availability	Now	Now	October

*For use with CD-ROM

CW Chart: Michael Siggins

Apple trims fighting weight

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. last week closed an assembly plant in Fremont, Calif., and said it will eliminate roughly 345 jobs — or 2.5% of the 14,000-member work force — as part of a broad-based consolidation of its worldwide manufacturing and distribution activities.

The realignments are a by-product of a highly competitive IBM-compatible clone market that has seen the price of personal computers plummet dramatically during the past 18 months.

Apple Chairman John Sculley has continually vowed commitment to a cost structure that will allow the company's products to stay competitive and affordable.

During the past 18 months, he has changed the company's business strategy from one of selling expensive machines with high-profit margins to one of pushing high volumes of low-cost Macintoshes.

Company officials said they are closing the 700-employee Fremont plant to consolidate final assembly, testing, customization and distribution at a new distribution center in Sacramento, Calif.

Additional jobs will be lost at Apple's Cork, Ireland, manufacturing site.

An Apple spokeswoman said there are no final estimates on how much the consolidations will save the company. However, Apple will record a charge against earnings of about $20 million before taxes in its current fiscal quarter for expenses related to the realignment.

TWO-PHASE COMMIT SYBASE VS. ORACLE7

PROGRAMMATIC AND PROPRIETARY

```
two-phase()
{
/* open up two servers and a commit service */
  dbproc_server1 = dbopen(login, databasename1);
  dbproc_server2 = dbopen(login, databasename2);
  dbproc_commit = open_commit(login, NULL);
/*
** prepare data for each command buffer and select a database to
** use, then start distributed transaction on commit service
*/
  commid = start_xact(dbproc_commit, application, "my_xact", 2);
/*
** build transaction name and begin transactions on different
** servers
*/
  build_xact_string("","",commid, xact_string);
  dbfcmd(dbproc_server1, "BEGIN TRANSACTION %s", xact_string);
  dbsqlexec(dbproc_server1);
  dbfcmd(dbproc_server2, "BEGIN TRANSACTION %s", xact_string);
  dbsqlexec(dbproc_server2);
/* perform various updates and then.... */
/* if there is a failure on one abort all of them */
  if (return_code 1 == FAIL)
  {
       abort_xact(dbproc_commit, commid);
       dbcmd(dbproc_server1, "ROLLBACK TRANSACTION");
       return_code = dbsqlexec(dbproc_server1);
       dbcmd(dbproc_server2, "ROLLBACK TRANSACTION");
       return_code = dbsqlexec(dbproc_server2);
       if (return_code != FAIL)
       {
            remove_xact(dbproc_commit, commid, 1);
       }
  dbexit();
  exit(ERREXIT);
  }
/* otherwise prepare to commit */
  dbcmd(dbproc_server1, "PREPARE TRANSACTION");
  dbsqlexec(dbproc_server1);
  dbcmd(dbproc_server2, "PREPARE TRANSACTION");
  dbsqlexec(dbproc_server2);
/* as before if anyone fails then abort all, otherwise commit */
  if (commit_xact(dbproc_commit, commid) == FAIL)
  {
       abort_xact(dbproc_commit, commid);
       error_function(); /* rollback and remove each participant */
  }
  dbcmd(dbproc_server1, "COMMIT TRANSACTION");
  dbcmd(dbproc_server2, "COMMIT TRANSACTION");
  my_sqlexec(dbproc_server1);
  my_sqlexec(dbproc_server2);
  close_commit(dbproc_commit);
  dbexit();
}
/* define the subroutine which handles failure */
my_sqlexec(dbproc, dbproc_commit, commid)
DBPROCESS *dbproc;
DBPROCESS *dbproc_commit;
commid;
{
  return_code = dbsqlexec(dbproc);
  if (return_code != FAIL)
  {
       remove_xact(dbproc_commit, commid, 1);
  }
  return;
}
```

Source: D.O. McGovaran and C.J. Date. *"A Guide to SYBASE and SQL Server."* Addison-Wesley, 1992. Pg. 496, Fig. 27.1.

AUTOMATIC AND STANDARD

```
UPDATE   SAVINGS
SET      S_BALANCE = S_BALANCE - 250.00
WHERE    S_DEPOSITOR = 'JONES'
UPDATE   CHECKING
SET      C_BALANCE = C_BALANCE + 250.00
WHERE    C_DEPOSITOR = 'JONES'

COMMIT   WORK;
```

Early Client/Server RDBMS products, like Sybase, don't automatically assure the consistency of distributed transactions. When related data on multiple servers must be updated by one transaction, it is up to the applications programmer to write specialized program code to do it. LOTS OF CODE. Complex, unfamiliar, error-prone system control code that has nothing to do with business applications.

ORACLE7™, the Cooperative Server RDBMS, automatically processes distributed transactions, with NO SPECIAL CODE. With ORACLE7, all it takes to update multiple servers is the same simple SQL you would use for a single-server update. ORACLE7 lets applications programmers concentrate on solving business problems rather than computer problems.

For more information on ORACLE7's simple solution to distributed Transaction Processing, call 1-800-633-1071 ext. 8187 and commit to a better solution.

ORACLE®

Software that runs on all your computers.

©1992 Oracle Corporation. ORACLE is a registered trademark and ORACLE7 is a trademark of Oracle Corporation. Sybase is a trademark of Sybase, Inc. Call for product, service, and seminar information. In Ontario or Quebec call 1-800-263-8073, elsewhere in Canada call 1-800-263-8060

House damns Justice in Inslaw affair

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — A congressional report capping a three-year investigation last week said the U.S. Department of Justice stole software from Inslaw, Inc. and attempted to drive the firm into bankruptcy.

The report also charged former Attorneys General Edwin Meese III and Richard Thornburgh with blocking inquiries into the matter and ignoring the findings of two courts that had ruled in the tiny company's favor.

The report from the House Judiciary Committee said Meese has consistently denied any knowledge of Inslaw or of its contract to provide law enforcement case-tracking software to the department. However, the committee report revealed sworn testimony from former Deputy Attorney General Lowell Jensen that he had "briefed Mr. Meese regularly on the issue and that Mr. Meese was very interested in the details of the contract and negotiations."

The committee also said former Deputy Attorney General Arnold Burns testified under oath that he had been advised in 1986 by Justice Department attorneys that Inslaw's claims were valid and that they would be upheld in court.

'An abuse of power'

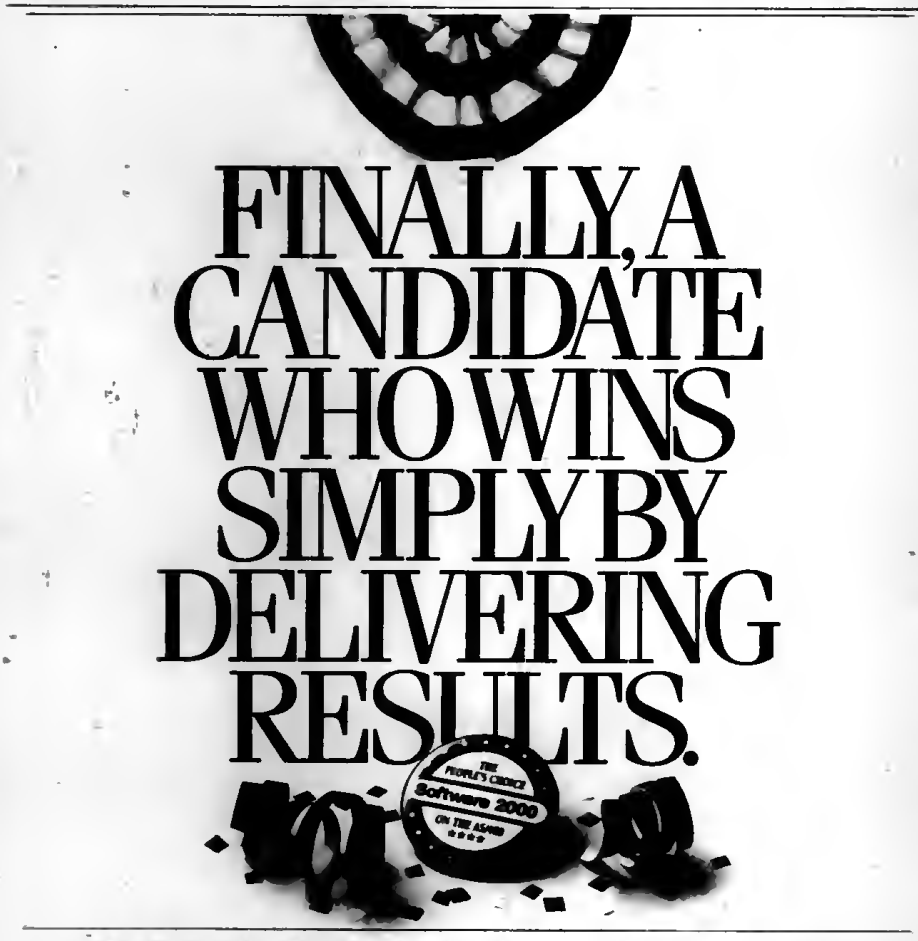
"It is incredible that the department, having made this determination, would continue to pursue its litigation of these matters," the committee wrote. "This clearly raises the specter that the department's actions taken against Inslaw ... represent an abuse of power of shameful proportions."

The former Justice Department officials could not be reached for comment.

Besides recommending appointment of an independent counsel, the committee also said the Justice Department should immediately compensate Inslaw for the agency's "continued unauthorized use" of Inslaw's software and for legal fees.

Inslaw President William Hamilton said he doubted whether the investigator will be appointed.

Among the matters the committee said the counsel should probe is the mysterious death of free-lance writer Danny Casolaro, who was found in a West Virginia hotel room last year with his wrists slit. He had been gathering material for a book about alleged corruption in the Justice Department. The report listed a number of flaws in the investigation by local authorities, who ruled the death a suicide.



SOFTWARE 2000 TOPS POLLING FOR POPULARITY, QUALITY, AND GROWTH

The people have spoken. In the 1992 AS/400 Software Market Survey by Sentry Market Research, Software 2000's Accounting and Human Resources/Payroll systems took the winning position in the "installed" category.

1992 SENTRY SURVEY
#1 Choice for Accounting:
SOFTWARE 2000

But this isn't just a popularity contest. There's a solid reason why businesses choose Software 2000 — they deliver. In addition, Software 2000 was awarded the software industry's highest award, the ITAA Quality Award, establishing the company as an industry leader in quality.

That helps to explain why Software 2000 has been at the forefront in helping more than 150 mainframe sites rightsize their operations: implementing mainframe-power applications on efficient new AS/400's. This growing customer commitment has resulted in four consecutive annual appearances for Software 2000 on the Inc. 500 list of the fastest growing private American companies. It also has

ITAA Quality Award

resulted in Software 2000's expanded product portfolio, now serving customers in the distribution, process manufacturing, and multinational marketplace.

1992 SENTRY SURVEY
#1 Choice for Human Resources/Payroll:
SOFTWARE 2000

Popularity, quality and growth: that's what you expect of a leader, and that's what you get with Software 2000.

For more information about Software 2000's complete suite of integrated applications, call (508) 778-2000.

Software 2000
THE PEOPLE'S CHOICE ON THE AS/400

IBM Business Partner

Financial Management 2000 • Human Resources 2000 • Process 2000 • Environmental Management 2000 • Distribution Management 2000 • Vision 2000 • Application Manager 2000
AS/400 is a registered trademark of International Business Machines Corporation

Lotus ships Notes imager

BY ELLIS BOOKER
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. will begin shipping its long-awaited document imaging companion product for Notes today.

Lotus Notes: Document Imaging (LNDI) is the result of a joint development agreement signed last April by Lotus and Eastman Kodak Co. Originally slated for June shipment, the product is the first of three complementary products for the Notes groupware platform due out this year.

The product, pronounced "lindy," allows users to capture, manipulate, store and display documents and other images as part of their Notes databases.

LNDI offers two ways to store and access images. Image files can be stored on a dedicated server — called a mass storage system — and linked to Notes databases using the Dynamic Data Exchange feature of Windows. Or images can be "embedded" directly into a Notes database. A dedicated server is recommended for Notes applications dealing with larger volumes of images.

New features

The next two Notes companion products will offer an optical character recognition server and inbound facsimile services. These companion products will be provided, respectively, by Calera Recognition Systems, Inc. and GammaLink, both in Sunnyvale, Calif., and are expected within a month.

At least one early user is pleased with the price, if not the results, of the offering. "Our experience with the imaging part has been very positive," said Sally Jennings, a Texaco, Inc. staff engineer who has been working with a test version of the product since April.

Texaco hopes to use LNDI to provide plantwide access to material safety documents. However, the LNDI purchase has not been approved yet, Jennings said.

For Jennings, one of the most attractive features of the system is its price — approximately $295 per seat. "We've done our shopping with other imaging vendors ... and this is considerably cheaper," Jennings said.

For now, LNDI runs off an OS/2 server and supports Microsoft Corp. Windows clients.

The Solution Series:

September 17
Parsippany, NJ
New York, NY
Quebec City, PQ

September 22
Sacramento, CA
Little Rock, AR

September 23
Syracuse, NY
Roanoake, VA
Grand Rapids, MI

October 2
Piscataway, NY

October 6
Philadelphia, PA

October 8
Houston, TX
Milwaukee, WI

October 13
Long Island, NY
Bethesda, MD
Portland, OR

October 14
Costa Mesa, CA
Atlanta, GA
Denver, CO

October 15
Hartford, CT

October 20
Lansing, MI
San Ramon, CA

October 21
St. Louis, MO

October 22
Greenville, SC

October 27
New York, NY

November 5
Dayton, OH
Bedford, NH
Baltimore, MD

November 10
Washington, D.C.
Ottawa, ON

November 11
West Orange, NJ

November 12
Coral Gables, FL

November 18
Pittsburgh, PA
Chicago, IL

November 24
Buffalo, NY

Cross Platform Seminars

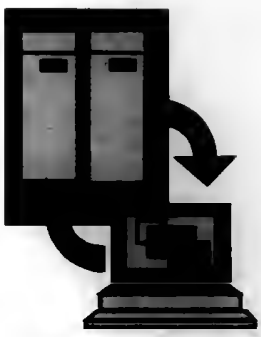
September 18
New York, NY

September 29
Providence, RI

October 15
Atlanta, GA

October 16
Hartford, CT

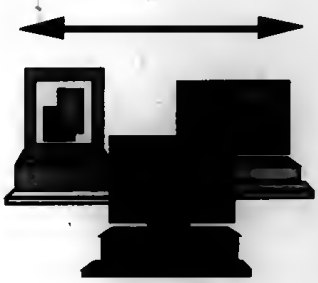
November 12
West Orange, NJ



Offloading Mainframe Development and Maintenance

PC Programming

Client/Server Computing



Cross Platform Programming

Four Issues. Nothing But Solutions.

Invest a Day At The Micro Focus Application Development Seminars.

You will address the most important aspects of workstation-based application development and maintenance: the cost savings, the productivity gains, and the increased program quality possible with the Micro Focus solutions.

Learn how to **Offload Mainframe Application Development and Maintenance** to the workstation and bring CICS, IMS, 370 Assembler and DB2 programming/debugging facilities to your PC through discussions and demonstrations of the Micro Focus products that put the mainframe on your desktop.

Make the most of your COBOL applications with Micro Focus **PC Programming** offerings and take advantage of the latest graphical user interfaces, optimize application performance on the latest PC architectures and look forward to object-oriented programming.

Considering a move to **Client/Server Computing**? See the Micro Focus development tools your existing COBOL programmers can use to quickly develop new systems with minimal retraining.

Cross-Platform and Open Systems Programming issues are covered in a separate seminar. See Micro Focus solutions that make the move to open systems as smooth as possible while preserving your software investment in existing COBOL applications.

Micro Focus has the answers. Call the Micro Focus Seminar Desk to register for the no-cost Micro Focus Application Development Seminar near you. Call 415-496-7160 and discover *"A Better Way of Programming."*

IBM Alliance International AD/Cycle

MICRO FOCUS®

Micro Focus Inc., 2465 East Bayshore Road, Palo Alto, CA 94303 Tel (415) 856-4161

GSA Contract Number: GS00K9AGS5251PS02

Micro Focus is a registered trademark and A Better Way of Programming is a trademark of Micro Focus. Other trademarks noted are trademarks of their respective companies

IBM to unveil slew of PC LAN products

BY ELISABETH HORWITT
CW STAFF

NEW YORK — IBM is expected to shore up its position in the personal computer local-area network market this week with a barrage of LAN management, internetworking, frame-relay and client/server introductions, several sources said.

The introductions are expected to be the first in a series of announcements that will greatly improve the ability of IBM customers to integrate their disparate LAN installations with existing IBM equipment.

Of particular interest to users will be new LAN and frame-relay capabilities for the IBM 3745, which will finally let users support high-speed LAN traffic over their existing Systems Network Architecture backbones, analysts said.

IBM is expected to meet the above user needs this week by announcing frame-relay switching capabilities for the 3745, as well as an add-on frame for high-end 3745 models that will support Escon and up to eight Token Ring attachments.

Complementing the above will be a frame-relay card for Personal System/2 workstations running OS/2. Priced at less than $1,000, it is said to enable users to send data from a LAN out over a frame-relay link.

IBM is also expected to play catch-up with seasoned players in the LAN hardware arena with the following announcements, according to analysts briefed by the vendor last week:

- An agreement under which IBM will private-label Chipcom Corp.'s intelligent LAN hubs and a statement of direction to merge IBM's Token Ring card with Chipcom's per-port switching capability.
- 4/16M bit/sec. Token Ring cards supporting at least 30% better throughput than IBM's current offerings and aimed directly at Madge Networks, Inc.
- The first IBM-manufactured Ethernet cards, expected to be priced at less than $300. The cards will support IBM PC ATs and PS/2s.

Other products expected:

- A new AIX Netview/6000 version that supports the Open Software Foundation's Consolidated Management Application Programming Interface.
- A Netview/6000 application featuring built-in intelligence to automate system management tasks such as correlating alerts from multiple devices.
- A new version of IBM's CICS OS/2 client/server program that will enable an OS/2 workstation to send out a single request for data from multiple CICS hosts.
- An open framework that is said to facilitate the integration of different vendors' SNMP Management Information Bases on the same SNMP network management system.
- Netview applications, including an upgraded Netview Distribution Manager.

Retailer nears end of huge IS overhaul

CONTINUED FROM PAGE 1

facility will be "primarily an office," rather than a data center environment, Dratch said.

Some 140 operations personnel garnered from the four data centers will manage and monitor the centers remotely on personal computers linked by a Token Ring local-area network and IBM Systems Network Architecture backbone, according to Dratch.

JC Penney expects to get "most of the economies of scale of a large data center, and at the same time, the backup and disaster-recovery characteristics of multiple data centers," through lights-out operations, Evans said. "A lot of good technology in hardware, [drive] robotics, data communications and automation software is permitting us to enter into this phase."

The move is expected to eliminate 300 management and non-management positions from JC Penney's IS staff, which currently numbers 1,500. The company said it expects to make some of the cuts through attrition and to find work for some displaced staff members in other parts of the organization.

The restructuring will not result in any cutbacks of data processing facilities, Evans emphasized. Indeed, JC Penney increased its total million instructions per second capacity by 25% in the last few months, by trading up a group of IBM 3090 and Amdahl Corp. 1400 mainframes for higher end models, he said.

Healthy growth

Indeed, aggressive fat-trimming and cost-containment have helped JC Penney recover from a grim fiscal 1991, according to David Poneman, a research analyst at New York investment company Sanford C. Bernstein (see chart). Profits were up 70% in first quarter 1992 and 200% in second quarter 1992 compared with last year's figures, Poneman added. One big factor was "a very effective marketing program this year;" another was tight controls that have kept cost growth at JC Penney close to zero this year, excluding advertising, Poneman said.

The data center restructuring comes on the heels of a corporate restructuring, "with some job losses," announced late last year, Poneman said.

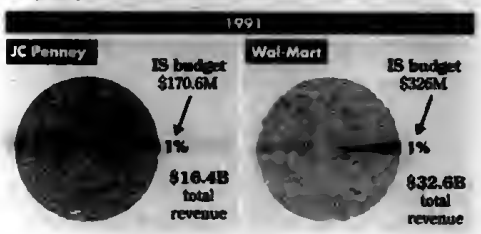
Most of the routine work of maintaining and managing systems operations at the center will be handled by Legent Corp. systems automation software, such as the company's Automate product line, Dratch said. "They have a product that is rules-based and permits automation to be put under the covers — so you can operate the computers with them managing themselves," he added.

The software was chosen after almost a year of testing partly because it supports JC Penney's IBM MVS, VM and Application System/400 computers, as well as Amdahl Corp. and Tandem Computers, Inc. computers, Dratch said.

A related initiative, which IS embarked on at the beginning of this year, aims at implementing a "quality management process in our organization," Dratch said. The process targets issues such as time management and involves "re-engineering how we do our jobs to improve effectiveness and efficiencies in delivering quality output."

More bang for the buck

JC Penney and Wal-Mart spend the same percentage of revenues on IS, but Wal-Mart has made better use of computers to boost its sales, analysts say



CW Chart: Stephanie Faucher

Retailer revamps

JC Penney's push toward lights-out data center operations is just the latest in a series of downsizing, cost-cutting and budget-trimming maneuvers that retailers are practicing to survive in the '90s.

Indeed, JC Penney's restructuring follows close on the heels of Sears, Roebuck and Co.'s decision to outsource its information systems and networking operations to Advantis, the recently formed outsourcing company that Sears will hold jointly with IBM [CW, Aug. 24].

"It's not a sign of weakness; it's just the way the industry is," said David Poneman, a research analyst at Sanford C. Bernstein in New York.

"Both Sears and JC Penney have had their profits chomped by feisty mark-down merchants such as Wal-Mart Stores, Inc. and Kmart Corp. And a major competitive edge the latter two firms enjoy is their ability to "tie technology to turnover" through applications such as just-in-time inventory and retail networking, said Howard Anderson, president of The Yankee Group, a Boston-based research firm.

Both Sears and JC Penney wield powerful corporatewide data networks and heavy-metal IBM data centers. But "a mainframe is a $14 million or $22 million liability. It's not an asset until I figure how to use it to run my firm better or increase inventory turns from 12 [turns] to 15 per year," Anderson said.

ELISABETH HORWITT

Southwestern Bell nets JC Penney HQ

BY ELISABETH HORWITT
CW STAFF

DALLAS — JC Penney Co. troweled in yet another crucial piece of its computing strategy for the 1990s last week when it announced its choice of Southwestern Bell to implement the networking infrastructure for its brand-new headquarters here.

Competing against the likes of AT&T, GTE Corp. and IBM, Southwestern Bell won an $11.2 million contract to install the wiring, routers, hubs and switches that will support JC Penney's voice, data and video needs "well into the next millennium," said Marty Holder, an information systems project manager at the retail firm. "Southwestern Bell's was the most comprehensive, the most technically compliant and cost-effective solution. Their being local to the community was attractive also."

A key component of the installation will be cabling that brings unshielded twisted-pair, shielded twisted-pair and fiber to every office in the building, Holder said. "We required a single information outlet so that each office, workplace and conference room" has access to the same networking resources, he added. The custom-spun cabling was manufactured by Siecor Corp.

Currently, videoconferencing is one of the few applications at JC Penney that requires the high bandwidth of fiber, Holder said. However, the company expects to need the bandwidth as time goes on, he added.

The company specified Cisco Systems, Inc. routers to support a mixture of IBM Systems Network Architecture traffic and local-area network traffic such as Transmission Control Protocol/Internet Protocol, Holder said.

Headquarters is in the unusual position of straddling the turf of Southwestern Bell and independent telephone company GTE, Holder said. JC Penney took advantage of the situation by using Southwestern Bell facilities to back up GTE, he said.

GTE, the primary local carrier, will provide Integrated Services Digital Network (ISDN) Primary Rate Interface voice lines from headquarters out to long-distance carriers, Holder said.

While JC Penney has been a test site for ISDN, this is its first commercial implementation. Again, JC Penney expects the technology to take it well into the next millennium — as soon as carriers begin deploying it more widely, Holder said.

In addition, the firm has set up two master communication rooms, both on-line and hot, so at least half of the building will remain on-line even in the case of a massive network or computer failure, Holder said.

"THE TASK IS TO INTEGRATE THE OLD AND THE NEW."

To a great [illegible] bulldozer is over.

Buildings, like the [illegible] Union Station, are saved. And made even more valuable by putting them to new uses. Architects call it adaptive re-use.

There are parallels in computing.

Mainframes are saved. And made even more valuable by becoming part of the on-line enterprise. Software architects call it mainframe integration.

There is one software architecture that is designed to integrate the old and the new. Sybase.

Sybase integrates any CICS application and data source—IMS, VSAM, DB2 and more—into an advanced client server computing environment. The mainframe becomes a high performance server in a network of PC workstations and minicomputers.

Sybase. Client server architecture for the on-line enterprise.

To find out more about our database, application development and connectivity products, and multi-vendor consulting services call 1-800-8-SYBASE.

©1991 Sybase, Inc.

SYBASE

CLIENT/SERVER ARCHITECTURE FOR THE ON-LINE ENTERPRISE

Telco inertia can imperil network use

BY JOANIE M. WEXLER
CW STAFF

OXFORD, N.C. — Companies taking responsibility for their own network destinies should be careful when changing carriers not to disconnect one network service before another is turned on. Otherwise, they could wind up with dead networks while multiple carriers dredge through the paperwork and hookups needed to coordinate service.

Carolina Steel Corp.'s Concrete Division learned this the hard way last week when its efforts to shift a dedicated 56K bit/sec. service off of MCI Communications Co. lines and onto Advanced Telecommunications Corp.'s (ATC) network ran amok, leaving the firm with no network while a new service order is being implemented.

"We haven't figured out what it will cost, but we're losing a lot of time having to hand-carry information, call other sites to find out what's going on and wait to key in purchasing and receiving information" to remote computers, said Victor Wong, MIS manager. For pricing reasons, Carolina Steel decided to switch from MCI to ATC for the long-haul portion of its 56K bit/sec. service between headquarters here and a Colfax, N.C., manufacturing and sales estimating site about 100 miles away, Wong said.

New order

The new scenario involved disconnecting the MCI service and ATC contracting with two local carriers at each end of the trip: regulated Southern Bell and independent Carolina Telephone. The original order didn't account for Carolina Telephone's involvement — a customer error — and the service orders had to be reissued.

This resulted in MCI service being turned off with the new service not yet up. MCI was willing to reconnect in a couple of hours, Wong said, but Southern Bell could not commit to service sooner than two to three weeks, saying it needed to start processing the order all over again, Wong said.

While Wong acknowledged that the problems were in part self-inflicted, he expressed frustration with the regulated local phone companies' seeming inability to respond quickly.

"There is ton much red tape and a lot of union influence in the telecommunications industry, and the local exchange carriers are inflexible because of this," Wong said. "Without competition in the local loop, they don't have to provide good service."

Carolina Telephone, as an independent, was able to work quickly with MCI to get the circuit back up, but Southern Bell was bound to an official procedure. However, a Southern Bell spokesman said the company is working feverishly to expedite the service.

Wong made the original decision to switch long-distance carriers because MCI's monthly quote of $900 for the circuit showed up as $1,500 on Carolina Steel's telecommunications bill. When Wong discovered the discrepancy on its first bill after four months of service, MCI explained that "the local phone companies had increased their tariffs, and MCI had to pass those costs on to us. But they never told us before the fact," Wong said.

ATC quoted the same service at under $800, Wong said.

IBM to users: 'It'll cost you'

CONTINUED FROM PAGE 1

"Sooner or later, it had to stop, and it's stopping."

He said that although he still has access to the full range of technical support services, the process is now "more reactionary; they respond to problems instead of coming on-site and constantly looking at things and monitoring to make sure nothing happens." Still, Dean said, "I haven't had or heard of any major problems."

Others are more upset. David Brantingham, director of computer operations and technical services at Western Publishing Co. in Racine, Wis., said he has had to change his in-house hiring plans. "Where I had originally intended to be supported by IBM, now I have to look for more technical staff than before."

He added that the telephone support line is sometimes not sufficient. "Occasionally, with very technical problems, you need to have someone come in and show you how to work through it."

Another customer at a large bank in New York said, "There has been a noticeable change in the level of support. Our DB2 and VM experts were taken away, and we're fighting to get them back because we don't have the in-house people to support these systems."

The change in IBM support has become increasingly evident to customers within the past year — largely because of IBM's downsizing. By year's end, IBM will have about 300,000 employees, in contrast to last year's 344,400 [CW, Aug. 3].

The right direction

Marty Clague, general manager of consulting, software and services at IBM U.S., said the move from permanent, not-for-charge support technicians at major customer sites has been under way for roughly three years. He maintained that telephone support and pooled experts are actually better for customers.

"Rather than having someone show up and wait for something to happen, customers are able to pick and choose what services they want," Clague said. Users can also specify exactly what kind of technical support they want and in which areas. This also allows IBM to keep hardware prices low, he added.

Telephone help lines have been set up so that the experts who answer customers' calls on a particular question are the ones who did the development work. DB2 experts are in California, and OS/2 and AIX specialists are in Boca Raton, Fla. When customers call in, the experts check a database to see if the problem has already beeo called in and solved. If not, the expert recreates the problem and then attempts to fix it over the phone.

"It's just a better arrangement all around," Clague said. IBM trading-area managers have the authority to decide which technicians work "for free or for fee," he said. "We will sometimes provide free talent for a specific thing."

Some customers, even those who have had their on-site IBM technicians redeployed, agreed it will be better for both customers and IBM in the long term. James Matsey, corporate director of information systems at Reynolds Metals Co. in Richmond, Va., said, "I lost an RS/6000 expert because someone else was willing to pay the hourly rate. Sure, it bothers me, but if this is what it takes for IBM to get their costs down and allow them to succeed, I'm for it."

John Wood, vice president of computers and network services at the Royal Bank of Canada in Toronto, said that although the number of free IBM technicians at his site has shrunk from 36 to 10, "it has had no impact on service. We still have access to whoever we need, and it's a better for us because we pay for only those services we choose."

Another reason it may be beneficial for customers, users said, is because it frees them to select non-IBM hardware to a greater degree than before. Without the on-site technicians, Matsey said, "I'm less tied to IBM. It's not really a problem."

Clague added, "Some customers like it, others don't. But they all want the lowest price, and we're willing to do that — but we're not willing to include 10 people in that price."

Buyer beware rules network services

AT&T accused of $1.4 million overcharge

BY JOANIE M. WEXLER
CW STAFF

A complaint filed recently with the Federal Communications Commission on behalf of five large corporations allegedly overcharged for AT&T network services may prompt users to reexamine the lines of demarcation between the responsibilities of corporate telecommunications managers and network carriers.

Auditing firm Telecom Services Limited West, Inc. in San Francisco filed an FCC complaint earlier this month for clients it says have for years been unknowingly receiving a portion of their tariffed network services in a more expensive manner than necessary.

The collective overcharges allegedly total $1.4 million.

The complaint addresses AT&T's provisioning of local private lines that it acquires from local telephone companies and resells under Tariff 11 contracts.

Some industry observers, though, pointed out that in today's market, where companies are trying to leverage competition among long-distance carriers for business advantage, it is incumbent on corporate telecommunications managers to know what they are getting and how much they are paying for it.

"It strikes me that in all cases caveat emptor [let the buyer beware] applies," commented Robert Rosenberg, president of Insight Research Corp., a consultancy in Livingston, N.J. "Quite often, network managers will turn to a dominant player [in the telecommunications market] to obviate the more difficult questions they must face as part of their job descriptions."

If they end up with an imbalance between meeting their needs and the price they're willing to pay, they must ask if they were doing due diligence to their jobs, he said.

Resource hurdle

The problem users have, though, is that tariffs and telecommunications bills are so lengthy and complex, it is the exceptional firm that has the human and financial resources to examine every service provisioned and billed with a fine-tooth comb, observed Phillip Evans, former senior adviser to the International Communications Association, a telecommunications user group.

"It behooves you to hire an experienced firm to go over the initial contract because the responsibility does lie on the part of the company being served by the tariff," Evans said.

For example, a spokesman from one complainant, Japan Airlines, American Region, said the firm is on the fence as to who, if anyone, is at fault but does "not mind Telecom Services pursuing the issue as long as it doesn't cost us anything."

Other FCC complainants include Quotron Systems, Inc.; Charles Schwab & Co.; Texaco, Inc.; and TRW Information Systems Group Credit Data Division. Most of the companies have reverted to the cheaper local service option and are still AT&T customers.

Routing compensation

The auditing firm said it has been negotiating with AT&T for nearly two years to get the companies reimbursed for "extra" charges levied for routing local private lines through its own equipment, one of two tariffed options.

AT&T allegedly defaulted to a scenario in which traffic passed through AT&T equipment if the user did not specify it wanted cheaper, direct connections from its premises to the local exchange office.

However, "The two options are clearly stated in the tariff, and customers are being charged accordingly," an AT&T spokesman said. In addition, he said, "When traffic goes through an AT&T central office, it allows better provisioning and testing capabilities of those channels" by AT&T.

Steven A. Taylor, president of Distributed Networking Associates, Inc. in Greensboro, N.C., said, "Companies buying service from AT&T are probably doing it because they want AT&T to be their sole provider, which implies network diagnostics and maintenance. There is value added by going through an AT&T switch. How much that value is worth is what the market will determine," he said.

According to Telecom Services President Scott Maltz, by using more equipment in provisioning the circuits, "AT&T doubled the equipment failure potential" and charged on average 250% more than the direct routes cost.

Toshiba to take pen market plunge

BY DAVID KELLAR
IDG NEWS SERVICE

TOKYO — Toshiba Corp. said last week that it will stick its toes in the pen-based market by introducing its first pen-based system here in December.

The Dynanote, a 386SX-class computer, weighs three pounds and accepts input from a cordless pen. The 10.6- by 8.27-in. machine has a 9.6-in. monochrome LCD screen with side lighting and supports 4M bytes of random-access memory (expandable to 20M bytes).

It also features a U.S.-made 1.8-in., 40M-byte hard drive. A 3½-in. floppy drive is optional. A nickel-metal hydride battery provides eight hours of battery life when the LCD side light is turned off and three hours when it is turned on. Side lighting can make it difficult to read the screen in bright light.

Shigenori Matsushita, general manager at Toshiba's Information Processing and Control Systems Group's Planning and Coordinating Office, said the company intends to market the Dynanote in the U.S. and other countries, perhaps six months after its debut in Japan.

"Most of those products are designed to be used in Japan," said Tim Bajarin, executive vice president at Creative Strategies Research International, Inc. in Santa Clara, Calif. "You [have to] approach the two markets differently; the form and function in Japan vs. here is completely different."

The Dynanote will be bundled initially only with Toshiba's Japanese-language MS-DOS Version 3.1, but Toshiba said it will also support Microsoft Corp.'s Windows for Pen Computing and Go Corp.'s PenPoint operating systems when Japanese-language versions are ready.

Toshiba was one of six Japanese vendors that recently licensed PenPoint for use with unspecified pen-based computers.

Microsoft plans to ship the Japanese version of its Windows product to computer makers next month. Go delivered the alpha version of its Japanese-language PenPoint 2.0J operating system last week and is on schedule to deliver a final product starting in late December.

Senior writer Michael Fitzgerald contributed to this report.

PI puts pen to notepad

BY MICHAEL FITZGERALD
CW STAFF

PORTLAND, Ore. — PI Systems Corp. has begun shipping the Infolio, a 3.4-pound, notepad-size pen-based system that is far cheaper than the other notepad-size pen-based systems on the market.

Based on Motorola, Inc.'s MC68331 processor, which uses a 68020 chip as its core, the Infolio costs $1,895. It runs its own operating system, Picos, which communicates in binary language with other environments.

PI, which stands for Portable Information, uses three Personal Computer Memory Card Interface Association slots: one for the operating system and the other two for additional electronic forms and data.

Its first announced user is the Stanford University Clinic in Palo Alto, Calif.

Hospital care "is becoming information-intensive, and we end up moving carloads of paper around so we can look at it and decide what to do," said Raymond Pedden, the clinic's director of operations. The clinic has 1,600 physicians and sees more than 250,000 patients a year.

Pedden said the clinic is at the very beginning of an effort to automate its medical records and create a sophisticated series of seamless databases running from accounting and diagnostics to ordering.

Initially, the clinic expects to buy between 50 and 200 Infolio systems.

Multi-Tech's New Data & Fax Modem for Laptop PCs

When you're in your office, you want power and performance from your modem. So why settle for less when you're on the road?

With the MultiModem/4, smaller is better.

Until now, "pocket modem" usually meant small size, with small features, less LEDs and poor flexibility. But with the new MultiModem/4, you get a state-of-the-art modem, with data speeds up to 14,400 bps (up to 56,000 bps compressed), and send & receive fax capability at 9600 or 4800 bps. You also get twelve LEDs and a speaker, so you'll know what's going on.

The MultiModem/4 runs on either AC or battery power, so you can transfer files and send or receive faxes at the office, from home, or on the road. You also get remote configuration, UNIX® support and "flash PROM" updating from our BBS.

All This, and Free Software Too!

We include everything you need to hit the road running, including our MultiExpress™ data and fax communications software. And if you're an Apple® PowerBook® user, we've got a version for you, too.

For more information, please call us at 1-800-328-9717.

MultiTech Systems

The right answer every time.

Trademarks: MultiModem, MultiExpress, MultiTech: Multi-Tech Systems, Inc., UNIX: UNIX System Laboratories, Inc., Apple, PowerBook: Apple Computer Corp.

Copyright © 1992 by Multi-Tech Systems, Inc

Multi-Tech Systems, Inc., 2205 Woodale Drive
Mounds View, Minnesota 55112 U.S.A.
(612) 785-3500, (800) 328-9717, U.S. FAX (612) 785-9874
International Telex 4998572, International FAX (612) 331-3100

NEWS SHORTS

Study cites magnetic field danger

Researchers in Finland reported that women who use VDTs that emit strong magnetic fields may have a greater risk of having miscarriages than women who use low-emission VDTs. The study of 191 clerks seems to confirm the validity of Sweden's guidelines for low-emission VDTs, according to Robert Dieterich, managing editor of "VDT News" in New York. However, the Finnish study found no difference in miscarriage rates between women who had used VDTs and those who had not.

Amdahl disk drive ready

Amdahl Corp. announced last week that it had moved up the shipment schedule for its 6390 Model 3 disk drive by a few weeks. Volume shipments are now scheduled to be available Sept. 21. Announced in January, the 6390 Model 3 holds 45G bytes of data and is priced from $148,000 to $457,950. Amdahl also announced a $20,000 Open Systems Expansion Feature that allows an Amdahl mainframe running UTS Unix to use 20% more of the disk space available in a 6390 Model 3.

HP/Samsung deal grows

Hewlett-Packard Co. and Samsung Electronics Co. last week extended their business alliance to include a $50 million purchase by Samsung of HP's Unix-based 9000 Series 700 workstations during the next two years. The $7 billion Korean electronics giant will now be reselling HP workstations under both the Samsung and the HP label, as well as using them internally to run computer-aided design and engineering applications and to develop software.

Prices, speeds hiked on Prodigy

The Prodigy service made several announcements last week, most notably that it would increase the monthly base subscription price for its on-line information network from $12.95 to $14.95 starting Nov. 1. Prodigy, which is owned by Sears, Roebuck and Co. and IBM, also said it would triple the number of bulletin board topics carried by the service to more than 400 and enable subscribers to edit messages off-line. Finally, Prodigy said it would support access from 9.6K bit/sec. V.32-compatible modems from major cities later this year.

Phone directory goes on-line

On the heels of the regulated local phone companies' recent admittance into the information services business, a dial-up, electronic version of the greater Minneapolis telephone directory was announced last week by US West and worldwide telecommunications company France Telecom. The electronic directory offers published residence, business and government listings that will be continually updated by the service providers. Users can use their own words to search for products and services; for example, a consumer typing "fix my car" will receive a display of car repair and service categories to choose from, according to the companies.

Short takes

Leading Edge, Inc. bumped up its multimedia offerings by adding a 486DX and 486SX model to the line. . . . Redwood City, Calif.-based **Next, Inc.** last week announced the shipment of Next 3.0, the third generation of the company's object-oriented operating system. The update comes integrated with Novell, Inc. NetWare client software. . . . **Lawson Associates, Inc.** said Unix machines from Hewlett-Packard Co. are the hardware of choice for its financial, human resources and other packages, over IBM's RISC System/6000. . . . The Federal Trade Commission recently announced an antitrust settlement with Realty Computer Associates, Inc., a multiple listing service in Kansas City that had been charged with refusing to publish listings from part-time brokers, out-of-town brokers and property owners who want to sell without using a broker. . . . **Alisa Systems, Inc.** in Pasadena, Calif., said it will provide site licenses for AlisaTalk, its file and print services sharing software for Apple Computer, Inc. Macintosh and Digital Equipment Corp. VAX environments.

Virus threat could be overstated

IBM researcher suggests sparse connectivity reduces virus contagion

BY JAMES DALY
CW STAFF

YORKTOWN HEIGHTS, N.Y. — The mere mention of a computer virus may still put ice water in the veins of many information systems managers, but an IBM computer scientist claimed that rogue programs are less pervasive and spread more slowly than is generally believed. The reason: The world's computers are not connected to as great an extent as some may believe.

"Since most projections about viral spread are based upon the assumption of a fully connected world, the growth and dissemination of most viruses is comparatively slow," said Jeffrey O. Kephart at IBM's High Integrity Computing Laboratory. Kephart based his ideas on years of studying virus outbreaks, at both IBM and its customers' sites.

This does not mean that the virus threat is over and users can let down their guard. "In a fully connected homogeneous environment, a virus could spread explosively," Kephart said. "And I expect the virus problem to worsen until we see widespread use of effective countermeasures."

Kephart added that "obviously, as we continue to have more and more connectivity, there is the potential for more virus problems. But meanwhile, we are working hard to keep them under control." He added that it should be possible to control the spread of infection in local topologies by intervening locally when the problem has been detected.

Scare worked

Some researchers are seeing widespread deterrence. "People have taken the virus threat seriously — installing antiviral packages, telling their employees what to do if a virus pops up — and I suspect that is what is going to keep the spread down," said Charles Rutstein, a Bethesda, Md.-based virus researcher and author of *Executive's Guide to Computer Viruses.*

Although Kephart's research suggests that the spread of viruses may have slowed, the creation of them has not. Experts estimate that from 1,500 to 3,000 DOS viruses now exist.

Rutstein said more than 100 new DOS viruses were discovered this summer. "But not every virus is a huge threat to the planet," he said. Only about 20 viruses comprise 90% of today's infestations, with venerable favorites such as Stoned and Jerusalem-B continuing to crop up.

Edward Wilding, editor of the UK's "Virus Bulletin," added: "What many antivirus software developers are loath to admit is that most of these virus specimens are research or laboratory examples and have never been seen in the wild. Worldwide, only 70 or 80 viruses have ever disrupted real computers in real organizations.

"So it is very important to keep the problem in perspective. Doom merchants who purvey messages of the end of computing and universal contagion should be ignored."

Movie points to security concerns

CONTINUED FROM PAGE 1

that there is no such word as 'impossible' when it comes to cryptosystems," said Philip Chapnick, director of the Computer Security Institute based in San Francisco.

Last year, two Israeli mathematicians said they discovered a crack in the encryption scheme [CW, Nov. 4, 1991] that would allow them to decipher messages under certain conditions. The discovery of an Achilles' heel in DES, if verified, could have "a very significant impact" on whether DES is recommended as a standard.

DES has been followed by controversy since it was accepted by the National Bureau of Standards in July 1977. Invented by IBM in the early 1970s, the DES algorithm uses substitution and transposition processes and a key consisting of 56 bits, plus eight parity bits, to present more than 72 quadrillion possible key combinations to a would-be intruder. With frequent key changes, the algorithm satisfactorily renders confidential information inaccessible, many proponents feel.

But not everyone believes in its invincibility. "If a man made the DES, a man can break it," said Ian Murphy, a former hacker and now president of IAM/Secure Data Systems, Inc., a security consultancy in Gladwyne, Pa.

Some experts said the DES 56-bit key should be much longer (such as 128 bits), thus adding to the code's complexity. These scientists claimed that advances in technology now make it possible to break the DES by brute force; i.e., a computer can be programmed to attempt every possible combination until the correct key is discovered.

"With the machines we have, [DES is] on the margin of insecurity right now," said Martin Hellman, a professor of electrical engineering at Stanford University in Palo Alto, Calif.

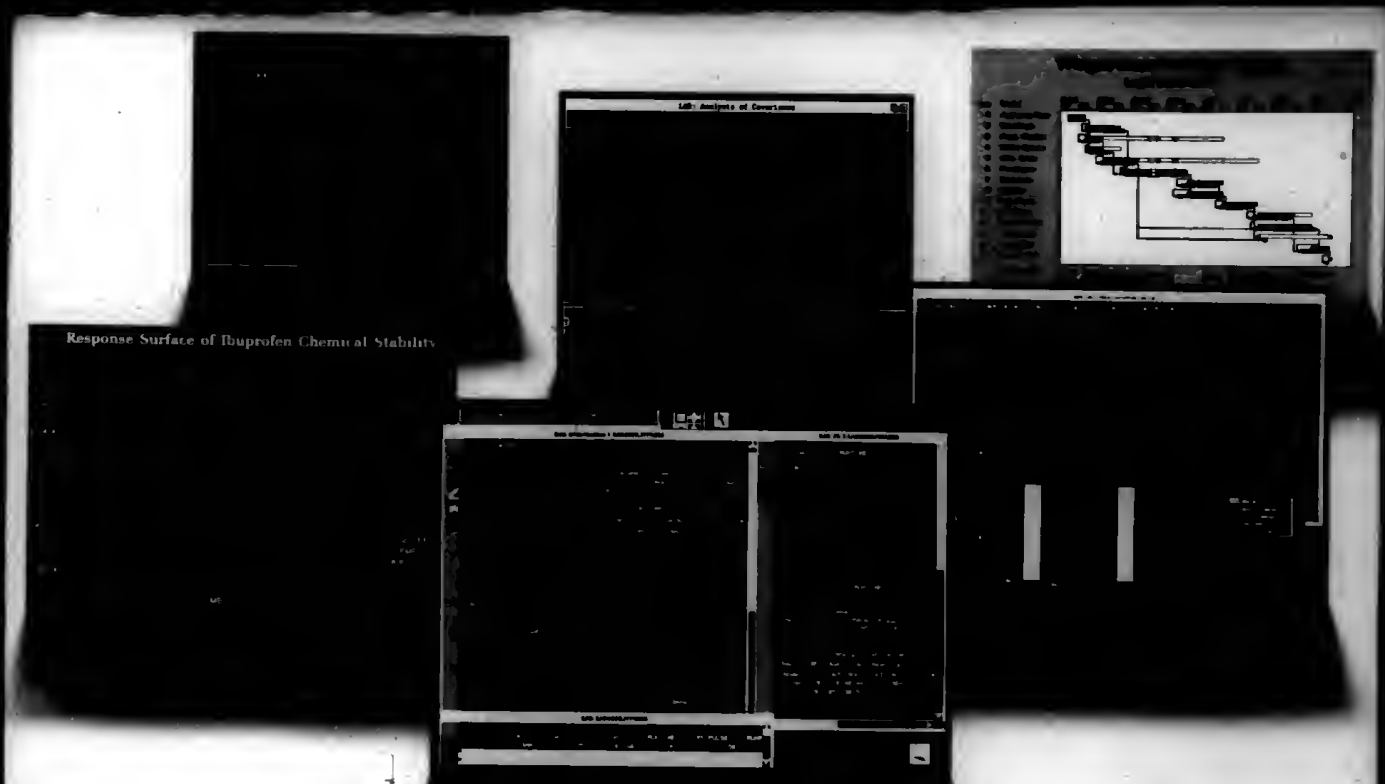
That could present a frightening scenario. Although different organizations often tweak the DES to suit their needs, the basic engine remains the same. And with DES in use by everyone from banks to air traffic controllers, the possibility that an intruder could scramble such sensitive data would present an immediate life-or-death crisis.

Supporters of DES, however, claim cracking the government-sanctioned code is a much more complex matter. The latest generation of vector computers, operating at one try per microsecond, would take more than 2,000 years to break the DES code, said Kenny Weilerstein, an analyst at research house Datapro Research Corp.

Changing keys regularly, as often as once a day or week, and double- or triple-encrypting the DES code could make it even more bulletproof, he added.

Real-world horrors

Mid-1970s — Teen computer whiz Kevin Mitnik breaks into the North American Defense Command in Colorado Springs.
July 1981 — Captain Zap — 23-year-old Ian Murphy — breaks into systems at the White House, Pentagon and Bell-South.
Mid-1980s — Researcher Clifford Stoll tracks West German hackers who had been rummaging through a DOD network.
November 1988 — Robert Morris Jr., son of the NSA's chief computer scientist, creates the Internet worm, resulting in an estimated $40 million to $90 million in damage.
July 1992 — Five men are charged with breaking into computer systems, including several credit reporting databases, and stealing account information.



A n Raw Data into Real Information.

The SAS® System for Information Delivery.

The head of new business development is demanding next year's sales predictions—by next *week*. The Total Quality Management team has found an outstanding new way to design experiments—but their stand-alone software doesn't know how to do it. And the CFO is still looking for spreadsheets—of unlimited size.

Unfortunately, your time *is* limited. And so is your budget for new analytical packages. So how can you possibly keep up with the diverse data analysis needs of your diverse user community? The answer is the SAS® System for Information Delivery.

One System for Your Organization's Entire Range of Data Analysis Needs

No matter what kind of data they're analyzing, your clients will get results they can trust with the SAS System. Renowned statistical tools are fully integrated with powerful operations research, econometric, and time series methods.

For specialized tasks, explore the SAS System's quality improvement, experimental design, clinical trials testing, laboratory data analysis, and visualization techniques.

There's even an interactive matrix language for the most advanced mathematical, engineering, and statistical needs.

Call Today for a Free Evaluation

See for yourself why more than 20,000 companies—from aerospace to agriculture, manufacturing to medical research—trust their most important data to the SAS System. Just give us a call at 919-677-8200 to discuss your organization's analytical needs and to receive a free SAS System executive summary. Also ask for details about the SAS System Executive Briefing...coming soon in your area.

The SAS® System.
The World's Leading Information Delivery System.

SAS®

SAS Institute Inc.
Software Sales Division
SAS Campus Drive ☐ Cary, NC 27513
Phone 919-677-8200 ☐ Fax 919-677-8123

SAS is a registered trademark of SAS Institute Inc.
Copyright © 1992 by SAS Institute Inc. Printed in the USA.

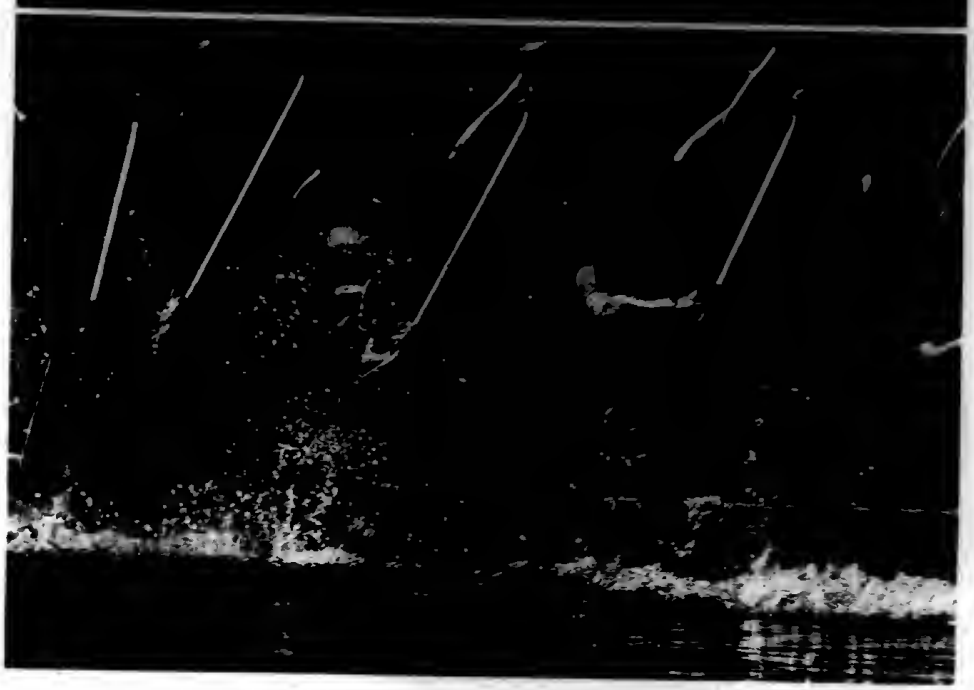
Network printing.

When it comes to network printing, you want to move swiftly. Give the job to the LaserJet IIISi printer from Hewlett-Packard.

The LaserJet IIISi printer has a 17 page-per-minute engine and a RISC-based formatter for fast text and graphics. It's also network-ready. When you add an HP JetDirect card, the printer is seen as a node on the network. That means you can place it anywhere along the network. Anywhere your users need easy access to their output. You're no longer limited by a faraway server.

The LaserJet IIISi avoids bottlenecks by pulling data through the interface card 30 times faster than the standard parallel rate. It is therefore able to print 18 times faster than ordinary printers. And, since your file server is relieved of some print server functions, you'll enjoy faster transaction times and increased speed across your entire system.

Network printing with the LaserJet IIISi.



With an HP JetDirect card, the LaserJet IIISi is able to function seamlessly with your current network because we collaborate directly with network operating system vendors. In fact, HP's Novell Solution is Novell-certified.

Operating System	*Topology*
Novell Netware	*Ethernet/802.3* *Token Ring (4/16 Mbps)*
3Com 3+Open	*802.3* *Token Ring (4/16 Mbps)*
Microsoft® LAN Manager	*802.3* *Token Ring (4/16 Mbps)*
IBM LAN Server	*Token Ring (4/16 Mbps)*
AppleTalk	*LocalTalk* *EtherTalk*
*HP-UX***	*Ethernet/802.3*
*SunOS***	*Ethernet/802.3*
SCO UNIX	*Ethernet/802.3*

The fastest printer in the LaserJet family also speeds up the process for network managers. You can now troubleshoot the entire printing network and track data transfer from network to printer. You'll finally be able to take full advantage of your network management software.

For just $5,495,* the LaserJet IIISi wins the race. For more information, and the name of your nearest authorized HP dealer, call 1-800-LASERJET, Ext. 7096.†

LaserJet Printers

HEWLETT PACKARD

*Suggested U.S. list price for base printer. Optional HP JetDirect cards, $695–$995, purchased separately. **For operating HP-UX or SunOS, a one-time purchase of $100 in configuration software is required. UNIX is a registered trademark of UNIX System Laboratories Inc. in the U.S.A. and other countries. Microsoft is a U.S. registered trademark of Microsoft Corp. †In Canada call 1-800-387-3867, Ext. 7096. © 1992 Hewlett-Packard Company PE12271

Spreadsheet war moves to Windows

CONTINUED FROM PAGE 1

they're going to use every weapon," Berst said.

Indeed, Lotus last week reduced the price of 1-2-3 for Windows by $100 to $495, making it more competitive with the Borland product. Borland's offering will also list for $495 but will include both Quattro Pro Version 4.0 for DOS and Quattro Pro for Windows in one package. However, Microsoft remains the king of the Windows spreadsheet market (see chart).

"We have to be more directly responsive to the kinds of things that [our competitors] are saying about us," said Paul McNulty, Lotus' director of spreadsheet marketing. "We know that we have to do business aggressively."

More than cost

Lotus may need more than a lower price to outdo Borland, however. "I don't want them dropping their price; I want a good product," said Joel Diamond, technical director of the Windows Users Group Network in Media, Pa., and a former spreadsheet consultant. "Lotus has their work cut out for them." Diamond claimed that both Excel and Quattro Pro outstrip Lotus in a feature-by-feature and ease-of-use comparison.

Some users echoed his sentiment. Rock Blanco, vice president of information systems at Garber Travel in Boston, said he was particularly impressed with Quattro Pro for Windows' Database Desktop approach to data connectivity.

"It completely blows Lotus away," he said.

Early demonstrations of Quattro Pro for Windows detailed many features that differentiate it from Lotus, including a notebook metaphor, an "Object Inspector" capability that allows users to click on an object with the right mouse button to call up options, highly customizable graphing capabilities and an Interface Builder for creating custom applications.

But while Borland may have the technical advantage at this point, Lotus has what could be a more vital advantage in its knowledge of selling to corporate customers and its ability to provide a complete suite of software. Lotus recently announced the addition of Lotus Organizer, a personal information manager for Windows, to its SmartSuite package that includes 1-2-3 for Windows, Freelance Graphics, Ami Pro and CC:Mail — all for a list price of $595.

While Microsoft competes on this level with its popular Office suite, Borland lacks several key pieces, including electronic mail and a word processor.

The suites may not sell to everyone, however.

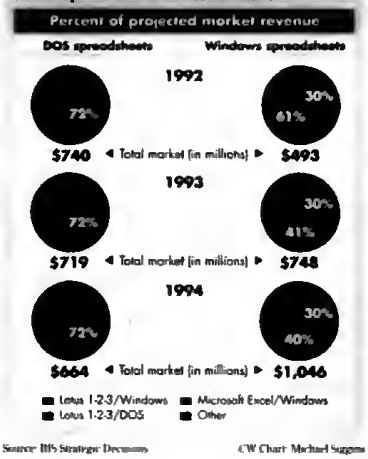
Berst said he sees the software arena divided into a commodity market for spreadsheets, word processors and databases that is interested in suites and "the rest of the world, which buys in ones and twos." Among the commodity buyers, however, the suites are "becoming more and more important." Yet while some large organizations may find the suites appealing, others see them as a waste.

"I would go for the best of any one item instead of going for any kind of suite," said Gene Ackerman, a consultant at Kaiser Foundation Health Plan. "Unless you're out in the woods, you don't need a Swiss army knife," he added, indicating that most of the several thousand users at Kaiser are interested in a single application and have little or no use for others.

Whatever the case, Lotus and Borland may have an opportunity to steal some of Excel's market share during the next year. Microsoft has revealed plans to include its ObjectBasic language in the next release.

Windows pain

Although still dominating the DOS spreadsheet market, Lotus is having problems making the same impression in the Windows arena



Source: IDC Strategic Decisions

CW Chart: Michael Siggins

SPC revamps hierarchy for suite battle

BY CHRISTOPHER LINDQUIST
CW STAFF

SANTA CLARA, Calif. — One company that fully anticipates the impending onslaught of suite selling is Software Publishing Corp. (SPC). To battle more effectively, SPC has elevated Irfan Salim, its international division vice president, to president and chief operating officer, and has bumped Chief Executive Officer Fred Gibbons up to chairman.

SPC is also implementing a new strategy focused on selling users on a presentation graphics-centered desktop, where they will access data and execute other functions from within a presentation graphics package — namely, Harvard Graphics.

Gibbons said the change in titles will allow him to "hit the bricks to develop and maintain key technology partnerships" and enhance relationships with customers while Salim concentrates on the company's day-to-day operations.

"The fight's getting tougher, and you need more help at the top," Gibbons said. Salim, 39, brings many years of experience in international marketing to the position, including stints as a vice president at Lotus Development Corp. and experience at Texas Instruments, Inc. in the UK and France.

Tough competition

SPC lacks a spreadsheet and does not have a word processor with a large market share — key pieces found in rivals' application suites. Also, SPC's core products, Harvard Graphics and SuperBase, are facing severe competition as the flow of applications development moves to graphical environments such as Microsoft Corp.'s Windows.

SPC recently announced SuperBase Version 2.0, an upgrade to its Windows database, and is planning to include data access capabilities in Harvard Graphics to allow a presentation-centered environment to be created.

"We believe presentation graphics, particularly when it's coupled with data, is a fundamental tool for viewing data in the corporation," Gibbons said.

Jesse Berst, publisher of "Windows Watcher" in Redmond, Wash., said that what SPC needs is alliances with other vendors, not a presentation graphics-centered product line.

"I just don't think very many people are going to live in a presentation program," he said. "I think [Gibbons] sees the big trouble he is in, but I don't think he's found the right solution."

Solbourne preps servers to run Oracle financials

BY MARYFRAN JOHNSON
CW STAFF

LONGMONT, Colo. — In an unusual move that may foreshadow a tilt toward greater specialization in the Scalable Processor Architecture (SPARC) market, Solbourne Computer, Inc. this week will announce two high-end Unix servers optimized specifically to run Oracle Corp. financial applications.

Solbourne is tying the fate of its new Series 6/700 and 6/900 servers to Oracle Financials as it tries to carve out a more lucrative piece of the SPARC market. The vendor's "Application Optimized Architecture" product strategy is counting on finding a middle ground between general-purpose Unix servers and highly specialized servers tuned to one vertical industry.

"In open systems these days, companies have to get specialized and focused," said Carl Herrmann, Solbourne's recently appointed president and chief executive officer. He cited the financial applications as one of the fastest growing areas at Oracle, adding, "We think we can grow even faster with our products tuned to theirs."

Oracle had a lock on more than 30% of the 1991 wordwide Unix-based financial software market, according to International Data Corp (IDC).

A year ago, 6-year-old Solbourne jettisoned its unprofitable line of SPARC clone workstations and restructured the company around its high-end, symmetrical multiprocessing servers. The machines are particularly well-suited to handling compute-intensive database applications, according to analysts.

"I think the strategy is a very obvious move. It's the way technology is going," said Chris Peterson, director of image processing at Earth Satellite Corp. in Rockville, Md.

The private company, which specializes in satellite data and image processing for clients such as the World Bank and the United Nations, is planning to upgrade a Solbourne Series 5 to the Series 6.

The Series 6 servers, scheduled to ship in December, are based on Texas Instruments, Inc.'s Viking SuperSPARC chip.

"We think it's great. We've enjoyed some of the enhancements in software and firmware already," said Marlen Roepke, director of information management services at Tampella Power, Inc., a $200 million boiler manufacturer in Williamsport, Pa. The company runs its entire business operation on a Unix-based network with several Sun Microsystems, Inc. workstations anchored by a Solbourne server.

As a beta-test user for the Series 6 server running Oracle Financials, Roepke said data throughput had "increased dramatically" once the company upgraded from the Series 5.

With revenue of roughly $70 million, Solbourne is the second-largest SPARC vendor in a market heavily overshadowed by Sun (see chart).

"Solbourne needed to really focus on providing a particular, differentiated product," said John Morrell, an analyst at IDC in Framingham, Mass. "They've got a very good, high-performance server product that is relatively unique in the SPARC market. They easily blow away Sun servers in database performance."

Solbourne officials said they expect to compete for Oracle applications mainly with Hewlett-Packard Co., Sequent Computer Systems, Inc. and Pyramid Technologies, Inc.

For the Series 6, Solbourne's OS/MP Unix operating system was enhanced with several Oracle-specific optimizations, such as improved context-switching code for typical Oracle environments with dozens of on-line users.

Analysts also noted that Solbourne's new servers — priced from roughly $75,000 to $250,000 — land within the budgetary reach of smaller companies that cannot afford systems in the $400,000 and higher strata.

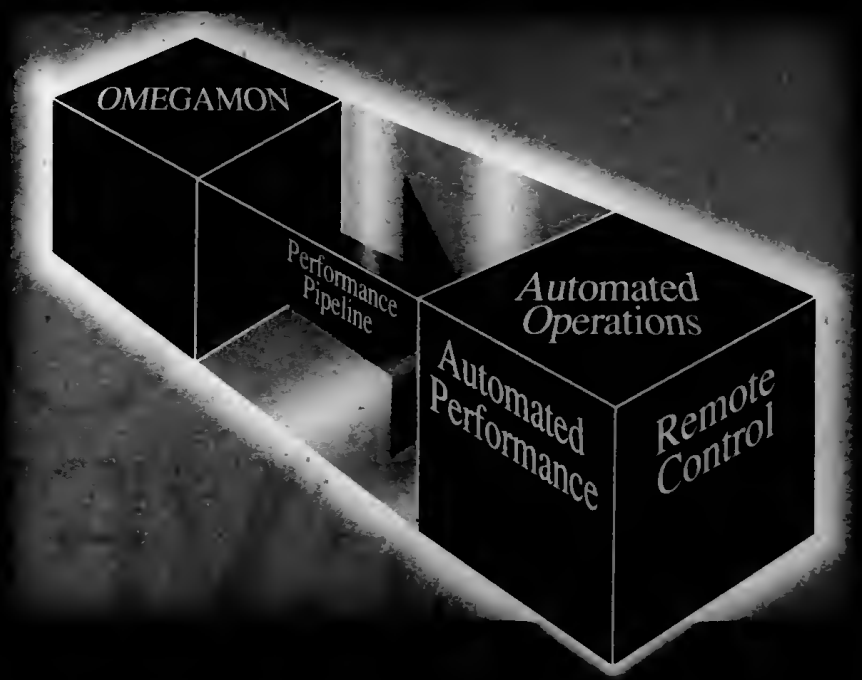
Under the sun

Solbourne is overshadowed by Sun in the U.S.' SPARC-compatible systems market

Total SPARC shipments: 201,740

Source: International Data Corp

What if you integrated the power of OMEGAMON with the speed of automation?



Candle's Performance Pipeline: Making your systems perform...automatically.

Most console automation is designed to automate routine events — the expected, the normal. But what about the unexpected? The abnormal?

Candle Automation goes beyond the console. The Performance Pipeline integrates the diagnostic capabilities of your OMEGAMON® performance monitors with Candle Automation.

Much more than an interface, the Performance Pipeline gives you turn-key, intelligent automation that diagnoses problems and resolves them.

Problems like slow response time, or threats to SLA. Working with OMEGAMONs for MVS, CICS, DB2, IMS and VTAM, the Performance Pipeline combines automation and problem solving for complete systems management.

And Candle Automation has everything you need in an automation solution — ease-of-use, fast implementation, a bi-directional interface to NetView, outboard capabilities, even availability alerts to other systems like DEC and Tandem.

There's one more advantage. Candle and IBM working together, sharing information and expertise, building better solutions for you.

For more answers, call 1-800-843-3970, Dept. 540.

Candle
Making your systems perform

A NEW LEVEL OF SU

© 1992 AT&T

PPORT.

AT&T 800 GOLD℠ SERVICE offers an even higher level of 800 service support and protection than ever before.

You go above and beyond—now there's an 800 service that does, too. Introducing AT&T 800 Gold Service. A *premium* product that goes beyond your already reliable 800 service to provide the ultimate in performance and dependability. For companies that literally can't afford to miss even a single 800 call; for companies that know a missed call is more than a missed opportunity—it could make a critical difference.

It starts with guaranteed call completion on the AT&T Network, where we go far beyond *assuring* your calls will get through—we *guarantee* it. If you ever experience a service problem, just pick up the phone. The 800 Gold Service Maintenance Center will restore service within guaranteed time limits—24 hours a day, 365 days a year.

No matter what the problem, you'll never be out of touch for long. Because, if your 800 calls are ever disrupted, we'll arrange alternate ways to keep you on speaking terms with your customers—the most important people in the world. And we'll do it within fifteen minutes after you indicate which alternate procedure you prefer or we'll credit your previous month's service charge.

Of course, there's a lot more to 800 Gold Service than superior call coverage. You'll get a Personal Billing Representative to quickly and efficiently tend to your account. An 800 Gold Hotline, dedicated exclusively to 800 Gold customers, where you can order a new service, check on an installation, report a problem, request an emergency backup service or get expert help with a billing question. And fast, guaranteed installation dates, a choice of routing options and access arrangements and much more. The bottom line: AT&T 800 Gold Service is anything but business as usual.

Call your AT&T Account Executive or dial 1 800 647-7777, and ask about AT&T 800 Gold Service. It takes toll-free in a whole new direction—*up*.

AT&T
The right choice.

Zenith wins mega micro DOD contract

BY GARY H. ANTHES
CW STAFF

GUNTER AIR FORCE BASE, Ala. — In the second but perhaps not final round of a controversial computer buy, the U.S. Department of Defense last week tapped Zenith Data Systems to supply defense and civilian agencies with 300,000 personal computers, related equipment and office automation software. The contract, one of the largest small-computer acquisitions ever, is estimated to bring the U.S. unit of the French computer maker Groupe Bull $740 million over three years.

The Desktop IV contract was first awarded jointly last November to CompuAdd Corp. in Austin, Texas, and Sysorex Information Systems, Inc. in Falls Church, Va., but it was pulled by the Pentagon when a number of the 22 companies bidding on the deal complained that their proposals were unfairly rejected because of minor flaws.

The split award was intended to encourage competition after the contract was signed, with each vendor guaranteed a small minimum in the first year. The U.S. Air Force said that would stimulate better service and eliminate the procurement bottlenecks that plagued Desktop III, which was won by Unisys Corp.

Last week, a spokesman for the Air Force, which manages the procurement, said the selection of Zenith was made "as an integrated assessment of all proposals for the best value."

James F. Kerrigan, federal program manager at G2 Research, Inc. in Mountain View, Calif., said Zenith most likely won the deal on price. "This means it's still a commodity business in the federal market because the higher priced, better-capability vendors like IBM and Apple did not win."

A PC on every desk
Desktop IV procurement at a glance

Estimated value	$740 million over one year with two one-year options
Hardware	Up to 300,000 laptop, notebook and desktop computers and file servers (plus peripherals)
Software	Microsoft Windows and Office; network operating systems from Microsoft, Novell and Banyan; development and runtime tools from Enable Software
Users	U.S. defense and civilian agencies around the world

Gerald Mixon, public sector general manager at CompuAdd, said the award to Zenith raised "troubling issues" but that CompuAdd had not yet decided whether to file a protest. "The Air Force has done a total about-face," he said. "The No. 1 evaluation criterion [in the government's request for proposals] was management and also financial strength."

Mixon said Zenith's non-U.S. parentage will strike a resonant chord in this election year. "The fact that they are a French company is ludicrous. Here's the Defense Department strengthening a French firm with obvious financial problems."

Mum's the word

A spokesman for Zenith, based in Buffalo Grove, Ill., said Zenith contributed $1.24 billion in revenue to its French parent last year but would not disclose further financial details. "Groupe Bull is very much committed to our success. We are the company's desktop strategy, and they've been increasing our research and development budget 25% a year since the acquisition" in 1990, he said.

Of the charge that Zenith is not a U.S. company, the spokesman said, "Our major manufacturing facilities are all in the U.S. We are a U.S.-based company."

"Zenith has certainly shown it knows how to get the maximum benefit from these contracts," said Robert Dornan, senior vice president at Federal Sources, Inc. in McLean, Va. "They got Desktop II for 90,000 units initially, and they milked it for 400,000 units, and they did a very good job. But it remains to be seen what their unit prices are and whether they can make any money."

It has been reported that Unisys "mispriced" its winning bid for Desktop III, lost money on every unit it sold and consequently limited sales as much as possible.

"HOW CAN WE CUT NETWORK COSTS WHEN OUR TRAFFIC IS GOING UP 20% A YEAR?"

A critical issue faces almost every data communications network: Management wants cost control while users demand greater access. It doesn't seem to matter how big your network is. What business you are in. Or where in the world you send or receive data.

Enhance your network's peak demand capacity, create rock-solid reliability and still cut your outside telecomm charges up to 75% with the new Datamizer IV. Since 1983, Datamizers have collectively saved our clients over $450 million in line charges – worldwide and domestically.

No other single device can offer the Datamizer's integrated bandwidth on demand function, link maintenance, stat/inverse multiplexing, data compression and other transmission enhancements in a simple, plug-in installation. No re-engineering. No additional equipment purchases. No training and no downtime.

Performance and reliability improvements completely transparent to system operator and system user. The new Datamizer IV. The connection between performance and profitability.

CALL (313) 995-1555

Symplex

Net savings for your network

Symplex Communications Corporation, 5 Research Drive Ann Arbor MI 48103, FAX (313) 995-1564
In Europe, Gevers Deynootweg 61, 2586 BJ Den Haag, The Netherlands FAX 31 (0) 70-3521711.

Check out the Marketplace Pages on Page 123.

A Bottom-Up Approach To Rightsizing Can Turn Out To Be Just That.

SOFTWARE AG INVITES YOU TO A FREE MANAGEMENT SEMINAR

RIGHTSIZING WITHOUT CAPSIZING

A bottom-up approach to rightsizing promises to rescue users from a "host" of problems. But below the surface, fierce undercurrents threaten disaster.

Uncontrolled decentralization can lock you into platforms and software solutions that force you to be reactive; to support systems lacking standards, integration, data integrity, recovery and security.

The alternative to this uncontrolled, revolutionary approach is an evolutionary approach. One that lets you be proactive. Fixing what's wrong without losing what's right. Changing course without abandoning ship. Rightsizing without capsizing.

The bottom-line is a top-down approach to rightsizing. One that empowers IS to design and deliver enterprisewide client-server solutions in multiple platform environments. Without retraining. Without restaffing. Without recoding.

The key is true application portability and integration linked with powerful networking facilities, yielding a time-proven implementation strategy. We provide you with the flexibility and control to handle whatever is on the horizon; from a changing business environment to emerging new technologies.

Learn to thrive, rather than survive in these changing times. Simply attend one of the FREE management seminars on Rightsizing Without Capsizing when it comes to a city near you. Your company can chart a course for rightsizing without turning everything else upside down.

To reserve your place, call 1-800-843-9534, ext.100

SOFTWARE AG
SOLUTIONS WORLDWIDE

We make the most complete And we stand behind

When your job description includes buying portable computers by the tens, twenties, thirties and hundreds, you naturally want to know a bit more about the company that makes those computers than you'll discover by reading their spec sheets.

T6400DX

(Although our spec sheets do make excellent reading.)

T2200SX

For example, we thought you might like to know that in the sometimes here-today, gone-tomorrow world of personal computer companies, Toshiba is the market leader in portables—part of a $33 billion company with an R&D budget larger than most companies' annual revenues.

Not only do we sell more portable computers, we make the most complete line of portable computers, designed to meet every conceivable need. From our 5.5-pound T2200SX business notebook that fits sideways into half a briefcase to our remarkable new T4400SXC, the first 486 active matrix color notebook computer on the market.

T3300SL/120MB

Each portable computer in our line has been engineered for easy integration into your existing system—providing all the important ports you need, in addition to the unique expandability option of our DeskStation IV, which comes complete with everything necessary to turn your Toshiba portable into a desktop computer.

T6400SXC

We also provide the broadest range of accessories—adapters, modems, memory cards—to make your portables (amazing as it sounds) even more useful.

© 1992 Toshiba America Information Systems, Inc. The Intel Inside logo is a trademark of Intel Corporation.

line of portable computers. every one of them.

T4400SXC

Of course, one of your principal concerns is reliability. Fortunately for you, it's also one of ours. That's why we've always gotten consistently high marks for reliability. (Just ask our hundreds of thousands of satisfied users.)

In the event that you do need service, we provide the kind of support you'd expect from a company like Toshiba.

T3300SL/80MB

For example, every one of our portables comes with our standard international warranty, covering parts and labor for one year in 24 countries worldwide.

T6400SX

We also offer a 7-day/24-hour electronic bulletin board, providing access to Toshiba technical support as well as to utilities that can enhance your computer's performance.

T4400SX/Gas Plasma

On-line telephone support and assistance from Toshiba technicians are always just an 800 number away.

There's even an 800 number for the international traveler.

T4400SX/LCD

In fact, there's even an 800 number for you, right now, today.

It's 1-800-289-1400. Just call and we'll be glad to send you more information. Or arrange for an evaluation of your needs. Or refer you to your nearest Toshiba dealer.

intel inside

Which, after everything we've told you, does seem like the logical next step.

In Touch with Tomorrow

TOSHIBA

ADVANCED TECHNOLOGY

Fire: Predicting the unpredictable

Insurance researchers use modeling, expert systems to understand fire's behavior

BY JAMES CONNOLLY
CW STAFF

"Yessirree, this is a darn nice data center yoo've got planned. Let me just see one thing," said the engineer, clicking away on the ootebook computer.

"Ya know, if you put in a fire wall over there, you'd cut the risk of a major fire by, oh, 20%."

This kind of advice, plus a detailed understanding of how a fire will travel through a given building, may be possible in the future if Ronald L. Alpert and his associates at Factory Mutual Research Corp. have their way.

The researchers are applying modeling software and expert systems to that horrendously complex phenomenon known as a "fire."

Full-scale modeling of a fire makes airplane designing seem easy because fires have so many physical and chemical reactions, according to Alpert, manager of the fire and explosion research department at Factory Mutual. The company is part of Norwood, Mass.-based Factory Mutual System, a nonprofit company owned by three insurance carriers.

A fire may send a billow of smoke along a ceiling and into another room, or its plume of gases may travel upward at 60 miles per hour only to be hit by a spray of water from a sprinkler system. Meanwhile, radiation and convective heat transfer and the rate at which fuel is consumed are other variables to consider.

The first type of building targeted under the Factory Mutual project is the phone company switching office, such as the Illinois Bell facility in Hinsdale, Ill., that burned and left businesses paralyzed for months without communications in 1988.

But the models and expert systems being developed can be applied to other structures as well.

One early beneficiary could be the data center, which is similar to a switching office in many ways.

Factory Mutual's work involves breaking a fire into "modules" and ranges from burning small material samples in test chambers equipped with sensors that monitor the flow of gases and heat to burning buildings to test sprinkler systems.

The results are collected on Concurrent Computer Corp. real-time computers and analyzed on Sun Microsystems, Inc. and Hewlett-Packard Co. workstations.

Because the readings show ranges of temperature and gas flow, they are analyzed on a graphical spreadsheet called Dadisp from DSP Development Corp. in Cambridge, Mass. Dadisp deals with curves instead of individual numbers.

While several organizations have done limited models of fires in the past 20 years, those models tended to focus on single rooms within a residence and needed a well-defined starting point. Alpert noted that the models typically did not relate to commercial properties such as warehouses and their varied contents.

Factory Mutual is trying to put all of the pieces together in such a way that many variables, each analyzed as its own module, can be substituted in to or out of a model. This tool would give a Factory Mutual field expert insight into how a fire would progress and the type of damage it would cause.

Variables might include the sprinkler system capacity, the products stored in a warehouse or even the stacking of those products.

Paul A. Croce, manager of the protection and risk analysis researcb department at Factory Mutual, is overseeing the development of several such expert systems, the first being one for telephone central offices. "Even a small fire, if it generates a lot of smoke, is a problem because it's the corrosive action of the combustive agent that causes much of the damage," he said.

Among the "knowledge modules" Croce can draw on are models that look at how smoke ages and how its particles settle on surfaces. Another module looks at what type of damage is done to electronics over time. The field engineer can use the model to show different outcomes. Each model has associated with it a probability of occurrence and level of damage.

"The field engineer can then look at it and look at the probabilities and come up with a scheme for protecting the customer," Croce said.

Preliminary models have been verified in real-world experiments, and the central office system is scheduled for rollout in about 18 montha. The system, being built with Nexpert from Neuron Data in Palo Alto, Calif., will be delivered on Intel Corp. 1486-based notebook computers with 200M bytes of storage.

Expert systems dealing with data center fires are a logical next step, Croce said. In a data center, like the central office, wire insulation is a primary fuel, damage to electronics is a major concern, and the entire business is at risk because corporations have become so reliant on computers.

Factory Mutual Engineering Corp.

Data collection *behind fire modeling starts with test-burning of material samples*

Bellcore council to explore future needs

BY ELLIS BOOKER
CW STAFF

What advanced network technologies are racing our way? Bellcore, a research and development organization owned by the nation's seven regional Bell holding companies, has been preoccupied with answering this broad question since it was formed out of the breakup of the Bell System in 1984.

Bellcore scientists have explored technologies ranging from superconductivity to video phones and have provided crucial network interconnection standards to both its owners and the industry.

According to its critics, however, Bellcore has been less successful at hearing what users need or explaining its own blueprint for the network. Enter the Bellcore Advisory Council. Composed of 15 academic, scientific and educational leaders, the council will hold its first meeting this month.

Along with investigating a panoply of advanced networking technologies, the group will, inevitably, "explore puhlic policy questions in light of technological issues," said Boh Meese, Bellcore's vice president of human resources and external affairs.

Significantly, the advisory panel will include top representatives from the National Association of Regulatory Commissiooers, which proposed the council idea in 1991 and participates on similar gas and electric industry councils.

Over the years, state regulatory commissions have been at odds with efforts by local phone companies to initiate new kinds of network technologies and new pricing structures.

Meanwhile, representatives from user companies on the Bellcore panel said they were looking forward to taking their wish lists directly to an entity responsible for setting network research priorities.

Future considerations

Panel member Colin Crook, chairman of the Corporate Technology Committee at Citibank NA, praised the creation of the panel as "a superb thing."

He said he planned to underscore Citibank's belief that "data traffic will grow at a hell of a rate in the coming years" and that the public network must be ready to handle this load.

The panel will consider the following public oetwork technologies:

- "Nomadic" devices that will enable users to conduct voice or data calls over wireless networks.
- Fiber-optic-based broadband applications, including broadcast video and videoteleconferencing.
- Self-healing and self-configuring networks.

Introducing a note of caution, Crook observed that network planning cycles of yesteryear may no longer apply, given the rapid pace of technological innovation.

For instance, Integrated Services Digital Network was originally conceived by predivestiture AT&T as a 20-year project, he said. At the same time, Crook said, customer requirements for network services have stopped being slow and predictable.

On the other hand, Crook said he is confident businesspeople "don't yet grasp that, if these guys do what they plan, there will be an extremely exciting [network] infrastructure."

RIGHTSIZING WITHOUT CAPSIZING

- ☐ ATLANTA, GA — THUR., OCTOBER 23
- ☐ AUSTIN, TX — TUES., OCTOBER 20
- ☐ BALTIMORE, MD — THUR., OCTOBER 29
- ☐ BOSTON, MA — TUES., OCTOBER 27
- ☐ CHARLOTTE, NC — TUES., OCTOBER 27
- ☐ CHICAGO, IL — TUES., NOVEMBER 10
- ☐ CLEVELAND, OH — FRI., OCTOBER 30
- ☐ DALLAS, TX — FRI., OCTOBER 16
- ☐ DENVER, CO — THUR., OCTOBER 15
- ☐ DETROIT, MI — THUR., NOVEMBER 5
- ☐ FT. LAUDERDALE, FL — THUR., OCTOBER 29
- ☐ FT. LEE, NJ — THUR., OCTOBER 23
- ☐ HARRISBURG, PA — THUR., NOVEMBER 5
- ☐ HARTFORD, CT — TUES., OCTOBER 6
- ☐ HONOLULU, HI — TUES., NOVEMBER 10
- ☐ HOUSTON, TX — TUES., OCTOBER 13
- ☐ INDIANAPOLIS, IN — THUR., NOVEMBER 12
- ☐ JACKSONVILLE, FL — THURS., NOVEMBER 19
- ☐ KANSAS CITY, KS — TUES., OCTOBER 6
- ☐ LOS ANGELES, CA — TUES., OCTOBER 27
- ☐ MEMPHIS, TN — TUES., NOVEMBER 17
- ☐ MINNEAPOLIS, MN — THUR., OCTOBER 8
- ☐ NEW ORLEANS, LA — THUR., NOVEMBER 5
- ☐ PHILADELPHIA, PA — TUES., OCTOBER 20
- ☐ PITTSBURG, PA — TUES., OCTOBER 15
- ☐ ROCHESTER, NY — FRI., OCTOBER 9
- ☐ SEATTLE, WA — THUR., OCTOBER 29
- ☐ WASHINGTON, DC — TUES., OCTOBER 13

Sign me up for the Software AG free management seminar. I have checked the location and date of the seminar I will attend.

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

TELEPHONE _____

I WILL BRING _____ OTHER PEOPLE.

For complete information and quick registration call

1-800-843-9534, ext. 100

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO 2637 CLEARWATER, FL

POSTAGE WILL BE PAID BY ADDRESSEE

SOFTWARE AG

Executive Center
Suite 236
25400 US 19 North
Clearwater, FL 34623-9891

Not only do the world's top developers have Windows NT on their minds, they have it in their hands.

It's no secret that Microsoft® Windows NT™ is a 32-bit, multitasking, scalable operating system that can run applications for Microsoft Windows™ and MS-DOS®. As well as powerful new 32-bit applications.

But on July 6th, 5,000 developers from 22 countries saw exactly how good it is, firsthand.

That's because they went to the Windows™ Professional Developer's Conference. And after 3 very instructive days, they went home with the software development kit for Windows NT® to create new 32-bit applications for Windows NT and Windows 3.1.

They also saw Bill Gates, live on stage, presenting his vision of how Windows NT fits into the entire Microsoft Windows family of operating systems – the Big Picture, if you will.

Now you can get the picture, too. Call us at (800) 992-3675, Dept. HH7, for Windows NT™ Today, a videotape report on the Conference.

For your copy of the Win32 Preliminary SDK for Windows NT, give us a call at (800) 227-4679.

Now, you too can see the videotape report on the Windows NT Conference.

So call now. After all, if you're choosing an operating system for your company, then you should know about the latest development.

Microsoft®
Making it easier

In Canada, to order the Win32 Preliminary SDK kit, or for more information, call the Microsoft Canada Support Centre at (800) 563-9048. Outside the U.S. and Canada, please contact your local Microsoft representative. Videotape offer good only in the 50 United States. Quantities are limited. For more information in the U.S.A., call (800) 992-3675, Department HH7. © 1992 Microsoft Corporation. All rights reserved. Printed in the United States. Microsoft and MS-DOS are registered trademarks and Windows, Windows NT and the Windows NT logo are trademarks of Microsoft Corporation.

Only NCR Is Putt

ing It All Together.

Open, Cooperative Computing Offers The World's Most Complete Open Computing Solutions.

NCR has emerged as the leading supplier of a new way of computing. Offering performance enhancements and cost efficiencies superior by an order of magnitude to conventional mainframe-centered solutions. Designed to help your organization respond quickly to the challenges and opportunities of increasingly competitive world markets.

The NCR System 3000 Family is the most complete end-to-end open systems offering in the world.

No one is delivering more complete, and powerful, open systems solutions. A new generation of mobile computers with advanced networking built in. Pen-based systems. A full line of personal computers. Massively-parallel enterprise servers far surpassing traditional mainframes in power. NCR COOPERATION®—an innovative suite of enterprise integration software designed to help you re-engineer your business processes for greater efficiency. And the world's most comprehensive set of networking and connectivity products.

Our Open Networking Environment includes the most advanced networking and network management products available.

And that's just for starters. Our access to the world-famous R&D facilities of AT&T Bell Labs and the advanced parallel-processing technology of our Teradata organization will ensure that we maintain the lead in open enterprise computing solutions.

NCR COOPERATION is fast becoming the leading choice in enterprise integration software.

We have the people, the products, and the financial stability to provide you with powerful, cost-effective computing solutions worldwide. We're putting it all together for a growing number of forward-thinking organizations. We can do the same for you.

For a free brochure—"How To Build Truly Open, Enterprise-Wide Computing," phone 1-800-CALL NCR.

NCR
An AT&T Company

Open, Cooperative Computing.
The Strategy For Managing Change.

NCR is the name and mark of NCR Corporation. COOPERATION is a registered trademark of NCR Corporation. © 1992 NCR Corporation.

EDITORIAL

Gender gap

By most counts, the recession began about three years ago. And, by most reasonable counts, it persists today.

Historically, information systems had always weathered recessions in fine fashion and seemed to be doing fine even when the current recession hit the trough about 18 months ago.

But as shown clearly and demonstrably by our salary survey last week and the job satisfaction survey this week, the doo-doo has hit the fan. Recession-provoked downsizing has ravaged salaries, ending a decade-long unbroken streak of salary increases across the majority of the 26 job categories that we have sampled. People are toiling harder, longer and for less while new opportunities are scarce. It ain't pretty.

Given what's going on in the economy at large, it might seem that the only really unusual thing about our survey findings is that it took so long for the recession to hit IS. However, there was a far more disturbing finding that revealed a consistent gender salary gap — one that starts out at a modest few percentage points in entry-level management positions but balloons to more than 20% at senior IS management levels.

You can search hard to establish explanations for the pay gap and find few, if any, satisfying answers. Some say women aren't as aggressive as men when it comes to pushing for equal pay, absent any significant collective bargaining or unionization at the IS level to assure pay equity.

Others say working mothers are less inclined to make the same sacrifices as men on their way up the ladder, giving up visibility along the way. Still others say the gender gap reflects the same chauvinistic biases evident in the business world in general.

I'm not a woman, so it's pretty easy for me to sit back and academically speculate on why women appear to be getting the short end of the pay stick. But I can reflect on the wisdom of three women we interviewed [CW, May 18], who parlayed fast-track IS careers into high-level corporate management positions.

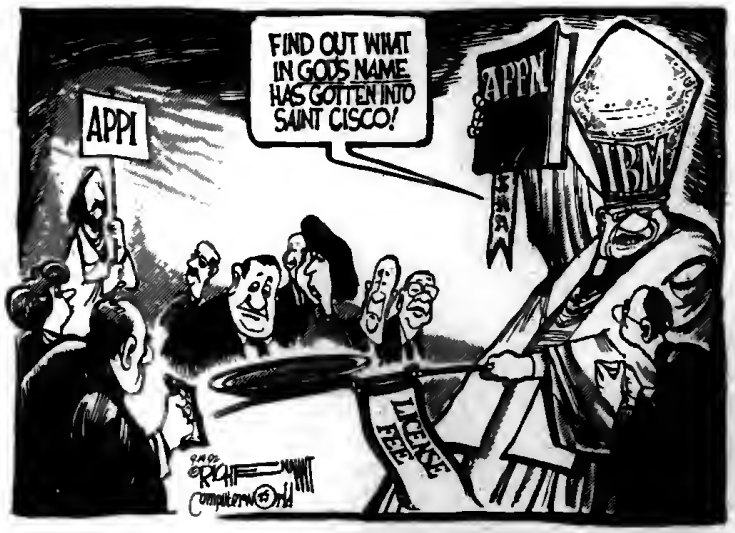
Essentially what they advised their sisters to do is seize control of their destiny. Women comprise maybe 3% or 4% of the senior-most IS positions, so they can't wait around for a man to promote their cause. As one of the executives said, "Men are not comfortable with women, period." The executives said to set your goals clearly, pursue them aggressively, and don't let any artificial barriers, such as the "men's club," block your way. And most of all, take control, take control, take control.

In other words, to steal and then tweak a few lines from Shakespeare:

Women at some time are
masters of their fates:
The fault is not in the stars,
But in ourselves...

Bill Laberis

Bill Laberis, *Editor in chief*



LETTERS TO THE EDITOR

Don't pull your mainframe's plug

Regarding "Dirty downsizing" [CW, Aug. 10], the concept of distributed computing is something that vendors have been espousing since the 1970s.

Certainly as more power makes it to the desktops and the cost of these systems declines, we'll continue to see the investment focused on the worker's desk rather than in the "fishbowl."

Even so, I wouldn't pull the plug on my mainframe quite yet.

The article alludes to a few of the invisible costs involved in downsizing. By the time you've completed new equipment purchases and conversions of systems, applications and networks, your anticipated cost savings can easily evaporate.

After further costs of retraining and bearing the burden of "integration snafus" that occur, anything less than a flawless execution may have serious repercussions on the organization's business.

Another concern is that if you distribute the processing, you also distribute the cost, work load and effort required to sustain the systems.

I'm sure the company's engineering department is quite capable of doing daily backups of their workstations and servers. But, will they?

And, more importantly, do you really want them to?

Bottom line: What works well today can be less expensive than embarking on a crusade to reinvent the wheel.

I'm sure I have overheard more than one data center manager say, "If it's not broken, don't fix it." Good advice!

Lynne Gregg
Seattle, Wash.

Be skeptical when downsizing

After reading the article "Insurer cancels host policy" [CW, Aug. 24], I realize that I need to be somewhat skeptical about the claims of great savings that can be realized when downsizing to personal computer networks.

The article states that "a 622M-byte VAX RA91 disk drive costs about $40,000." I'm forced to conclude that someone didn't do their homework.

There is no such thing as an RA91, but if we assume they were speaking of the 1.2G-byte RA90 introduced four years ago (an eternity in the computer business), it retailed for about $25,000. If I were comparing storage alternatives at today's prices, even the most naive shopper can acquire an RA90 for about $4,000 — twice the storage capacity at one-tenth the quoted figure!

I concede that there are many other downsizing issues that may in fact "slash costs," but if one assumes that Jerry Whetnall's boss trusts his comparative analysis, its no wonder that he "can cost-justify this stuff real easy."

Tim Killinger
Richmond, Va.

Sympathizes with OS/2 frustrations

Regarding "OS/2: Quirks & fixes" by Fabian Pascal [CW, Aug. 31], I found the article interesting, honest and, therefore, refreshing. Your paper has published what would appear to be the first unbiased review of OS/2 2.0 that I've seen this year.

I have experienced many of the same "difficulties" as Pascal. I have a Bernoulli box on my clone. OS/2 will not acknowledge its existence.

IBM's help desk advised me that I would have to get the driver software from Iomega. I have a ViewSonic-4 Super VGA monitor. Although ATI's video driver for OS/2 (not IBM's) supports Super VGA mode for the OS/2 desktop, I could not get the same results with OS/2 Windows. IBM's response? Get the driver software from the vendor. And while we're on the topic, where is the Windows 3.1 compatibility? IBM: We don't know.

As a professional programmer/developer, I am not usually daunted by new software packages.

OS/2 has proved to be the exception. (My personal favorite was when OS/2 refused to boot after I installed OS/2's EGA driver. Gee, let me look up the problem in the manual.)

My last complaint with OS/2 is that it took twice as long to deinstall as it did to install. But, hey, the box looks great on my shelf.

Micheal Shallop
Houston, Texas

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

What you know about Borland is great software

SIDEKICK®
The World's Most Popular PC Desktop Organizer

TURBO PASCAL®
The World Standard Pascal Compiler

INTERBASE™
The Highest Performance RDBMS Server with On-Line Complex Processing

BORLAND® C++
The World Standard Professional C and C++ Compiler

OBJECTVISION®
The Easiest Way to Create Windows and OS/2® Applications

R 1992 IS B

Ranked #1 (Company in J.D. Power

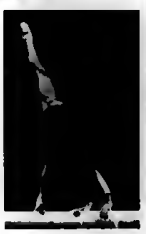
User Satisfaction Study.* The most awards for technical excellence worldwide.

What you may well Borland

BorlandEase

[redacted] company. You need more than vendors—you need partners. That's why Borland created EASE, the most innovative IS support program in the industry. EASE lets you *Evaluate*, *Adopt*, and *Standardize* your systems more *Easily* than ever, with quality programs and flexible options that give you more control over your systems, your time, and your budgets.

The most flexible programs



You may have heard that Borland products consistently win the most awards and are used by thousands of companies worldwide. You may not know that Borland is committed to being the *easiest* company in the world to do business with.

We're the only one of the "big three" PC software companies that provide customized solutions that work for you. Instead of asking you to do business "our" way.

We've made it so easy for you to do business the way *you* want to that we call our service program EASE—*Evaluate*, *Adopt*, and *Standardize Easily*. Quite simply, the flexibility of EASE puts Borland way ahead of our competition—so that we can put you way ahead of yours.

Here are some of the EASE programs that you can choose to create the service solution that's right for you.

An inside look

The **Executive Briefing** program lets you discuss your unique needs with Borland executives who talk your language. It's an opportunity to get an inside look at Borland's software and service direction. Because the more you know, the better decisions you can make.

Each briefing is tailored to address how Borland's software and services solve *your* critical issues. Issues like corporate mission, enterprise-wide data sharing, client/server technology, expediting applications development, and increasing user productivity.

More time to evaluate

The **Corporate Acceptance Program (CAP)** lets you evaluate products well before they are released, without the burdensome requirements of *beta* testing. By giving you more time to evaluate, CAP keeps your technology decisions ahead of the competitive curve. You have time to budget

not know is how works with IS

for software further in advance. And you learn how emerging products will fit into your company's fast-changing information architecture.

Reduced training costs

Borland employs more than 400 support experts to help your people quickly reap the benefits of greater productivity.

In addition to Borland's standard support, we offer a variety of **Enhanced Technical Support** programs from which you can choose the kind of support that's right for your users, your installation requirements, and your style of doing business. Here are just a few:

- ***Priority Support Hotline*** *provides instant, toll-free access to senior technical support engineers.*
- ***KnowledgeBase CD*** *puts an encyclopedia of technical information at your fingertips.*
- ***Discounted training materials,*** *like courseware and videotapes, speed your product knowledge.*
- ***VIP CompuServe Bulletin Board*** *gives you 24-hour access to top Borland engineers as well as thousands of expert users and developers.*

Easier upgrades

Borland's new **Maintenance Program** saves you from the paperwork, worry, and administrative hassle of upgrades.

Together we do "zero-based budgeting" around what you want to accomplish, and over the time frame you require. You get an upgrade program that's customized to your needs, and your style of doing business. We even offer a centralized delivery option that further reduces administrative costs.

Volume purchase discounts

The **Volume License Agreement (VLA)** gives you purchasing power combined with personal service. VLA gives you discounts on the software your users prefer, and the flexibility to work within your existing business relationships. You don't have to change the way you do business, because with EASE you can work with your existing resellers.

And VLA gives you more than discounts. The Gold Disk program makes it easy for you to control the distribution of new software in your company. Plus, you can order just the amount of documentation you need, and take delivery as often as you like to keep on-site storage to a minimum.

The greatest of EASE

There's nothing like Borland's EASE services to support you in putting the world's best PC software to work in your organization.

1. ***Executive Briefings*** keep you informed every step of the way.
2. ***Corporate Acceptance Program*** provides ample lead time for product evaluation.
3. ***Enhanced Technical Support*** keeps your users up and running . . . *(not to your office).*
4. ***Maintainence Program*** helps you keep pace with fast-changing technology.
5. ***Volume License Agreement*** gives you purchasing power combined with personal service.

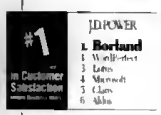
Borland delivers the services that IS professionals need, along with a time-tested track record for product excellence, reliability, and company stability.

Only Borland puts it all together for IS

ComputerWorld readers rank Borland tops

In *ComputerWorld*'s 1992 IS Brand Preference study, IS professionals were asked which brands of PC software they preferred. Time and again, Borland topped the charts.

A stable partner for the long term



Every aspect of our software and service is engineered to make your company more productive. That's why we win more technology and product awards worldwide than anyone else. Why we earned the prestigious J.D. Power and Associates 1991 ranking as the #1 software company (tied with WordPerfect) for Customer Satisfaction Among Business Users. Why Borland products are used in *every* Fortune 500 company. And why you can count on us to make your company more successful throughout the '90s and beyond.

COMPUTERWORLD PREFERENCE STUDY

	PC DEVELOPMENT TOOLS AND APPLICATIONS SOFTWARE			
	Database Management Systems (DOS-based)*	DBMS Client/Server Computing	System-level Compilers	Object-Oriented Programming Systems
Installed in company	#1 dBASE #2 Paradox	#1 dBASE #2 Paradox	#1 Borland C++	#1 ObjectVision
Best technology	#1 dBASE	#1 dBASE	#1 Borland C++	#1 ObjectVision
Best price performance	#1 Paradox	#1 dBASE #2 Paradox	#1 Borland C++	#1 ObjectVision
Best service/support	#1 Paradox #2 dBASE	#1 dBASE #2 Paradox	#1 Borland C++	#1 ObjectVision
Best documentation	#1 Paradox #2 dBASE	#1 dBASE #2 Paradox	#1 Borland C++	#1 ObjectVision
Prefer to do business with	#1 Borland	#1 Borland	#1 Borland	#1 Borland
Plan to buy	#1 dBASE #2 Paradox	#1 dBASE #2 Paradox	#1 Borland C++	#1 ObjectVision

ComputerWorld readers rank Borland software best in categories important to IS.

Technology you can trust

When you're working with Borland, you know your company is in good hands.

Our partnerships with companies like IBM® and Novell put you squarely in the mainstream of enterprise-wide computing. And our industry leadership in Object-Oriented Programming and data integration guarantees that the Borland products you buy today will fit into your information systems for years to come.

Great software and great service. Only Borland puts both together for you.

For more information on Borland products or the Borland EASE programs, call today

1-800-331-0877, ext. 5000

In Canada, call 1-800-461-3327

BORLAND

Software Craftsmanship

*J.D. Power and Associates 1991 Computer End User Satisfaction Study for Application Software Publisher Phase IV, Business End User Summary. Responses from Business End Users at 4,396 business sites.

Copyright © 1992 Borland International, Inc. All rights reserved. All Borland product names are trademarks of Borland International, Inc. OS/2 is a registered trademark of IBM. BOR 1563

COMPUTERWORLD

Editor in Chief
Bill Laberis

Executive Editor
Paul Gillin

News Editor
Alan Alper

Technical Sections Editor
James Connolly

Assistant News Editor
Patricia Keefe

Senior Editors
Elisabeth Horwitt, Networking
Rosemary Hamilton, Personal Computing
Neil Margolis, Management
Maryfran Johnson, Workstations
Jeanie M. Wexler, Networking
Johanna Ambrosio, Systems & Software
Garry N. Ray, Application Development
Ellis Booker, Advanced Technology

Senior Writers
Michael Fitzgerald
Melinda-Carol Ballou

Staff Writers
Carol Hildebrand
Kim S. Nash

New Products Writer
Lisa Davidson

Features Editor
Joanne Kelleher

Senior Editors
Joseph Maglitta
Lucy Zottola Dix
Mary Grover Brandel
Joyce Chutchian

Assistant Editors
Jodie Nane
Kelly E. Dwyer

Assistant Researcher
Stefanie McCann

Columnist
Jesse Berst

Research Manager
Michael L. Sullivan-Trainor

Research Coordinator
Kevin Burden

Product Research Coordinator
Derek Slater

Chief Copy Editor
Catherine Gagnon

Assistant Chief Copy Editor
Alice Leach Kelly

Features Copy Editors
Kimberlee A. Smith
Steven J. Condon

Copy Editors
Anne McCrory
Stephen P. Klett Jr.
Christine Maguire
Jill Zolot

Design Director
Nancy Kowal

Graphics Designer
Tom Monahan

Design Assistant
Jonell Genovese

Graphics Specialists
Michael Siggins
Stephanie Pincher

Cartoonist
Rich Tennant

Office Manager
Linda Gargone

Editorial Assistants
Lorraine Worrell
Connie Brown
Aleksandra Stulic

Rights and Permissions Manager
Sharon Bryant

Back Issues
Margaret McIndoe

News Bureaus
Mid-Atlantic
(201) 967-1350
Thomas Hoffman, Correspondent

Washington, D.C.
Mitch Betts, National Correspondent
(202) 347-8718
Gary H. Anthes, Senior Correspondent
(202) 347-0134

West Coast
(415) 347-0565
Jean Bozman, Senior West Coast Editor
James Daly, Senior Correspondent
Mark Halper, Senior Correspondent
Christopher Lindquist, Correspondent
Brenda Cruden, Editorial Assistant
(801) 532-4277
Michele Dostert, Correspondent

Midwest
(708) 827-4433
Ellis Booker, Bureau Chief

Main Editorial Office
Box 9171, 375 Cochituate Road
Framingham, MA 01701-9171
(508) 879-0700

Fax: (508) 875-8931
MCI Mail: COMPUTERWORLD
Subscriptions: (800) 669-1002

Can U.S. be content with morsels?

RICHARD KRAFT

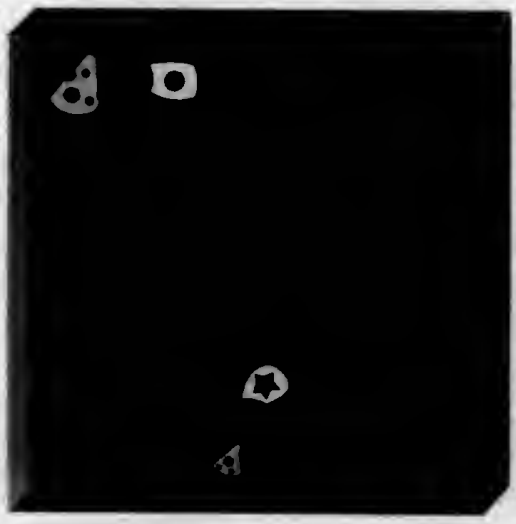
As an American executive in a U.S. subsidiary of a Japanese company, I have long shared my colleagues' profound admiration for American technology, which is still the best in the world in many areas such as computer and communications innovations.

Unfortunately, somewhere along the line we, as a society, lost interest in bringing our best ideas to market efficiently and competitively. In sharp contrast, Japan, the newly industrialized countries of Asia and the technology leaders of the European community have gained strength, based on their ability to rapidly turn ideas into products.

Our trading partners understand that to raise their standard of living they must not only work harder and smarter but also develop their technological strengths to make products that can succeed in a global economy. The sad truth is that their management of technology now reflects this priority and ours, with few exceptions, does not.

Change at home

As an electrical engineer with more than 40 years' experience in the electronics industry, I am distressed by the implications of this trend. We fool ourselves and shortchange our successors if we think that companies can somehow afford to continue technology policies that are short-term oriented, largely risk-averse and often misdirected. All too often, it seems that technology management decisions are based on figures generated by accounting or finance departments whose first priority is short-term returns.



Jonell Genovese

Attaining industry leadership requires decisions that transcend the numbers. In my company, technology investment decisions are based not only on evaluation of available financial data but also on a strong corporate conviction about intangible benefits. The automation of factory processes, for example, is justified not only by cost reduction, but by the fact that it frees workers for more productive tasks by eliminating heavy or hazardous jobs and reducing repetitive or monotonous work.

I also believe that the time has come for our society to channel investment into research and technology that will benefit endeavors that are our true sources of wealth — industries such as manufacturing, agriculture and mining.

Deep contribution

Information technologies in particular have much to contribute in helping to improve the efficiency and productivity of such industries and the lives of the people who work in them. Enormous technical and human resources were expended in recent years in the pursuit of paper profits, without making any substantial contribution to the improvement of society.

The closing of the 1980s did not signal an end to our national bad habits, but there are encouraging signs that companies are trying to come to terms with some of these problems. We now see more innovative, cost-saving international R&D alliances and technology-sharing arrangements. Investors, once again, are beginning favor the producers of products. Business school graduates say they find the manufacturing world more attractive.

Perhaps the right conditions are slowly developing for a technology renaissance in America. I hope so. But even under the best of conditions, it will take much effort and a strong commitment to undo the damage that flawed technology management policies have already caused.

Kraft is president and chief operating officer of Matsushita Electric Corporation of America.

What's a bug? Whatever the customer says it is

CURTIS E. A. KARNOW

What is a bug? Is it an incompatibility, a performance degeneration, a sign of bad design, a flow or just a misunderstanding between programmer and consumer?

Coming up with a common definition isn't easy because performance deterioration ignored by one user may be irritating to another and fatal to a third. It depends on the user's expectations and the specific mix of hardware and software.

The issue is increasingly serious, however, because users are multiplying their concurrent use of systems, including add-on software and hardware, and because contracts and litigation can depend on a commonly accepted treatment of software defects.

There's no question that performance expectations are becoming more stringent. Users upgrade hardware and demand that the software perform as well or better on the new platform, without regard to the fact that increased clock speed, caches, new video drivers, new fonts, memory managers and the like can all seriously interfere with a program's operation.

Users have also come to expect and rely on a wider range of features. It isn't good enough anymore for a spreadsheet to simply crunch numbers. The program must also communicate with a variety of printers, soundboards, VGA cards and drivers, *and* it must be compatible with its own older versions and competing programs.

These are all complications that make it increasingly likely that users will be disappointed by software's performance, and increasingly likely that contracts and litigation will be resolved in unpredictable ways.

Defining a software bug is not assisted by breaking down the severity of bugs into 3, 5 or 10 types. For example, there is no advantage to defining bugs as mild, moderate, annoying and so on, or as level 1, 2, 3, etc. These systems simply add further ambiguity to an already confusing situation.

And the fact is that software will continue to disappoint and fail in various degrees, no matter how stringent the standards we endorse, regardless of the extent to which we require object-oriented design or insist on common user interfaces and drivers or, indeed, agree on the general meaning of words.

> There is no advantage to defining bugs as mild, moderate, annoying and so on, or as level 1, 2, 3, etc.

Satisfaction guaranteed

However, if we cannot legislate industry standards or perfection, there is something else that we can do. We can insist that there be user satisfaction.

Those who hold the key to the code should provide no questions asked, money-back guarantees. They should also offer bug fixes at cost (no more than $1 per disk) and without disguise (no more slipstreaming fixes under the semblance of an update). Users are owed speedy public confessions of problems and announcements of workarounds, new drivers and the like.

Any other standard encourages deceptive practices, sours customer relations and risks the loss of irreplaceable data and business opportunities as users struggle with tools that don't live up to expectations.

These concepts can be applied to information services contracts for custom software and systems as well as mass market purchases. To be sure, these transactions are the subject of negotiations and (one hopes) tailored contracts, but the principle remains. The customer should be able to expect that he is buying an effective solution. Anything else is a breach of contract.

Karnow chairs the Competitive Practices Group at the San Francisco law firm of Landels, Ripley & Diamond.

When you spend ten years designing spreadsheets, you get pretty good at filling in the rows and columns.

While this is old news to the nearly 18 million people who use 1-2-3,® it bears repeating: according to a recent ComputerWorld study for spreadsheets, Lotus® is still the company people prefer to do business with. And still the company that offers the best service and support—across all major platforms.

1-2-3 is the *only* spreadsheet that runs on all major platforms: Windows,™ DOS, Macintosh,® OS/2,® UNIX® and palmtops. Our DOS version of 1-2-3 is still the world leader and choice among 74% of DOS users.* For those of you moving from DOS to Windows, 1-2-3 is undeniably your best bet. And 1-2-3 for Macintosh continues to receive high marks from users for being the easiest spreadsheet to use.

Now, we don't expect you to believe all this just because you read it in an ad. Instead, we invite you to find out about Lotus and 1-2-3 for yourself. Just call **1-800-872-3387, ext. 7052**** for a free demo disk of 1-2-3 on the platform of your choice.***

Lotus. Still on the top of the charts.

ComputerWorld Spreadsheet Brand Preference Study
First Place Winners 1992

POSITION	DOS	WINDOWS	MACINTOSH
FIRST PLACE Prefer To Do Business With	Lotus	Lotus	Lotus
FIRST PLACE Best Service/Support	Lotus	Lotus	Lotus

Lotus 1-2-3

*Based on Software Publishers Association share data, May 1992, for North America. **In Canada, call 1-800-GO-LOTUS. ***While supplies last. Demo disk not available for palmtop version of 1-2-3. ©1992 Lotus Development Corporation. All rights reserved. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. Windows is a trademark of Microsoft Corporation. Macintosh is a registered trademark of Apple Computer, Incorporated. OS/2 is a registered trademark of International Business Machines Corporation. UNIX is a trademark of UNIX Systems Laboratories, Inc.

Crop of notebooks ripe for fall harvest

BY MICHAEL FITZGERALD
CW STAFF

Forests of notebooks are growing in preparation for the fall. Many vendors are shipping notebooks with Intel Corp. I486SX or even more powerful processors, and several have introduced machines with innovative features such as detachable screens.

Leading the way is Advanced Logic Research, Inc.'s (ALR) Ranger MC4SX/20, a passive-matrix, color notebook based on Intel's 20-MHz 486SX chip. Irvine, Calif.-based ALR's Ranger series features chip upgradability, and ALR said the color product will run for five hours, then recharge in two hours while running. The 7½-pound box is priced at $2,949 with 4M bytes of random-access memory and an 80M-byte hard drive or at $3,249 for a 120M-byte hard drive. Both versions are shipping now.

Epson America, Inc. in Torrance, Calif., joined fellow notebook vendors in the price-cutting parade, dropping prices 20% on its NB-SL/20 and NB-SL/25 notebooks. The NB-SL series now starts at $1,800 with no hard drive or $2,199 with a 40M-byte hard drive. Epson offers systems without hard drives because its hard drives are removable.

Epson also cut prices on its external hard drive adapter, which was designed to let the removable hard drives work with a desktop machine.

Data General Corp., a Westboro, Mass.-based minicomputer and workstation vendor, also stepped up its efforts in the portable realm, announcing a new notebook. The Walkabout/386SL, a 5½-pound machine based on Intel's 25-MHz 80386SL, has a four-hour battery life. It has six I/O ports, a backlit triple supertwist LCD and either a 60M-, 80M- or 120M-byte hard drive. DG said the base model, with 2M bytes of RAM, will sell for $2,445.

While the larger vendors were trumpeting their fall lineups, several smaller vendors released portables with innovative features.

Rochester, N.Y.-based NovaCorp International, Inc. began shipping its Cruiser 325 Presentation Notebook PC. Built by Rever Computer, Inc., a Taiwan company, the 25-MHz 386SL-based Cruiser 325 features a detachable screen that can be used as a projection LCD panel. Users can also upgrade to an active-matrix, thin-film transistor color screen by year's end. The Cruiser 325 has a built-in track ball and interchangeable 60M- or 80M-byte hard drive and weighs 5.7 pounds. Prices start at $3,395.

NovaCorp said it will soon begin marketing a multimedia expansion station that will include audio capabilities and a Small Computer Systems Interface adapter for compact disc/read-only memory drives.

Noteable Computers, Inc. (NBI) in Fountain Valley, Calif., said it would add a Cyrix Corp. 486SLC-based system to its N400 line of notebooks. NBI offers 60M-, 80M-, 130M- and 180M-byte hard drive options, with prices starting at $1,999.

Beaverton, Ore., notebook maker Quantitative Technology Corp. announced the QTC3500, which uses a 33-MHz 486DX in a 7-pound package. With 4M bytes of RAM and a 120M-byte hard drive, the system is priced under $2,600. A 486SX-based notebook starts at less than $1,800.

Aurum Computer Corp. in Hingham, Mass., released the GoldnoteSX, a 6.4-pound notebook that uses the 486SX chip. Designed so the hard drive can be removed, the GoldnoteSX comes standard with an 80M-byte hard drive and 4M bytes of RAM, which is expandable to 16M bytes. Base price is $1,995.

Bitwise Designs, Inc., a Schenectady, N.Y.-based maker of heavy-duty portables, released its ScreenStar, a 39-pound computer with a 23-in. gas plasma monochrome screen. The ScreenStar comes with its own composite carrying case.

In addition to sporting the largest screen and heaviest weight of any portable shipping today, the machine offers what may be the best resolution of any portable, capable of supporting 1,280- by 1,024-pixel resolution. It includes three full expansion slots and a 50-MHz 486DX processor and will support up to 32M bytes of RAM.

The Bitwise ScreenStar comes with a 180M-byte hard drive and can support up to 1.2G bytes of storage.

ALR's Ranger series *features upgradability and can run continuously for five hours*

IN BRIEF

Firm inks pen pacts

■ **Communication Intelligence Corp.** signed its third licensing agreement in less than a week, as Montreal-based **MicroSlate, Inc.** and Tewksbury, Mass.-based **Arthur Dent Associates, Inc.** licensed Communication Intelligence's PenDOS operating environment and Handwriter Recognition Systems.

■ High-security workstation manufacturer **Datawatch Corp.** announced that it is negotiating a purchase agreement for the utility products division of **Microcom, Inc.**, which publishes virus detection and correction products for the Apple Computer, Inc. Macintosh and DOS environments. Thomas R. Foley, Datawatch's chief executive officer, said he hopes his firm would complete the buy "in the near future."

Snooper makes Mac house calls

BY JAMES DALY
CW STAFF

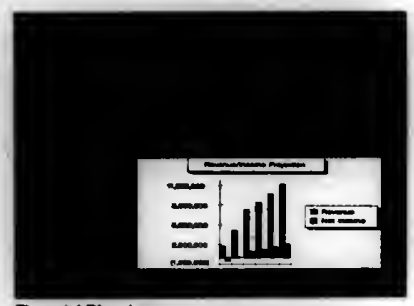
GLENDALE, Calif. — Is your Apple Computer, Inc. Macintosh feeling a bit woozy and under the weather? Is major surgery required? With Maxa Corp.'s updated Snooper diagnostic tool, it's easy to tell the difference.

The icon-driven Snooper 2.0 update helps users determine when a Macintosh doctor is needed by performing more than 200 component tests. Snooper 2.0 is not a magic wand for replacing service representatives, but it can detect and give hints for handling hidden problems and let users know what they are up against if they decide to take their Macintosh to a shop. Test results can also be printed.

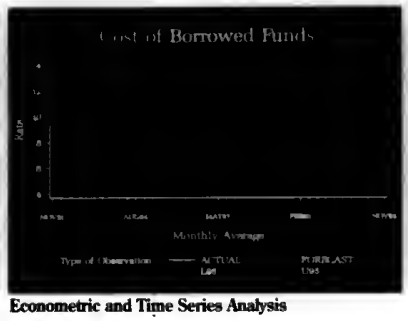
Snooper 2.0 identifies system configuration, runs benchmark tests, analyzes Small Computer Systems Interface drives and boards, evaluates random-access memory and checks video accuracy, among other things. A splashy new SIMM Finder also identifies defective single in-line memory modules (SIMM) by blinking their status in green or red.

Maxa has also increased the video tests Snooper performs. Enhancements include on-screen testing of video RAM, the ability to burn-in multiple monitors at once and the testing of certain accelerator cards.

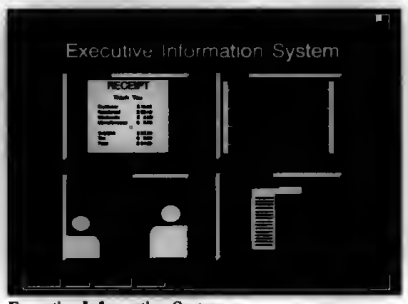
The $349 Snooper 2.0 kit includes software and a diagnostic Nubus board, which detects problems in hardware configuration when a Macintosh will not boot up. Software alone is $249. Free upgrades are available.



Financial Planning



Econometric and Time Series Analysis



Executive Information Systems

Quality Improvement

Computer Performance Evaluation

The SAS® System. The World's Leading Information Delivery System.

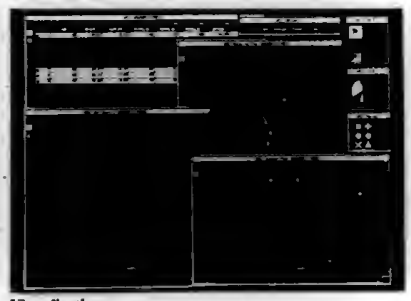
SAS Institute Inc.
Software Sales Division
SAS Campus Drive ☐ Cary, NC 27513
Phone 919-677-8200 ☐ Fax 919-677-8123

SAS is a registered trademark of SAS Institute Inc.
Copyright © 1992 by SAS Institute Inc. Printed in the USA.

Reporting

Market Research

Business Graphs



Visualization

Data Analysis

Project Management

WINDOWS VIEW

Jesse Berst

Out of the mainstream

Thanks to the recent advertising and public relations wars, you could be forgiven for thinking that spreadsheets, word processors and databases are the only things that exist in the Microsoft Windows universe.

The last two years have brought forth an amazingly diverse collection of shrink-wrapped software — nearly 6,000 packages. If you already have Windows workstations, you may want to leverage that investment by seeking out other productivity-boosting Windows packages. Here are a few examples:

• **People management:** Remember that management seminar you attended a few years back? The one where you learned all those great ideas for setting goals and "empowering employees"? Remember how you got tired of the paperwork and went back to the old way after a month or three?

The problem with many management schemes is the paperwork. Now there's a Windows software package called ManagePro from Avantos in Emeryville, Calif., to help you plan, delegate and track business goals. Included are modules for monitoring milestones and appraising an employee's work. There is also built-in "expert advice" from leading management experts. There's even a People Status Board that prompts managers to give periodic feedback, coaching and recognition.

When you delegate a task to someone else, it automatically appears on that person's list of goals. Alarms and reminders prompt you when to follow up. And here's something everyone will love — ManagePro has tools to speed you through those dreaded performance appraisals. Randy Dugger, who supervises nine people as manager of the workstation/LAN support group at Tandem Computers, says "I can take an objective and break it down into subgoals that I delegate to my staff. Every goal is documented, which saves me the drudgery of writing it all down, filing it and then looking for it again."

• **Asset management:** Some companies say the administrative costs of software distribution and licensing can cost as much as the software. Why not use Windows software to help with the task?

PC Galaxy from Apsylog SA in Palo Alto, Calif., is an English-language version of a Windows program from France. Due to be released next month, it lets systems administrators keep track of computer hardware and software. Extensive menus reduce data entry by letting users pick from lists. Once you've added equipment to the database, it can be sorted by user, brand and so on. PC Galaxy can monitor stock levels and generate orders when inventory slips below predefined levels.

If you want an automatic inventory of all your software, you might try CheckList by Touchstone Software in Huntington Beach, Calif., which performs a variety of auditing and inventory tasks. Thanks to a database of more than 4,000 programs and software publishers, CheckList can identify all the programs on the network (or on local machines), complete with version numbers and the publishers' name and address.

And if you want to combine asset management with a full-scale help desk, you might take a look at the new Windows version of Support Magic from Magic Solutions in Mahwah, N.J.

In addition to providing a centralized help desk database, Support Magic supports inventory tracking using bar codes. The product has optional modules for rentals, leasing, reporting, service contracts, purchasing and more.

■ **Desktop mapping.** Windows' GUI has led to a surge in mapping products for PCs. For instance, MapExpert from DeLorme Mapping in Freeport, Maine, is a CD-ROM product that contains a detailed map database of the entire U.S. Users can instantly call up a map of any location, searching by name, ZIP code or area code. Maps can be printed in any of 16 different scales.

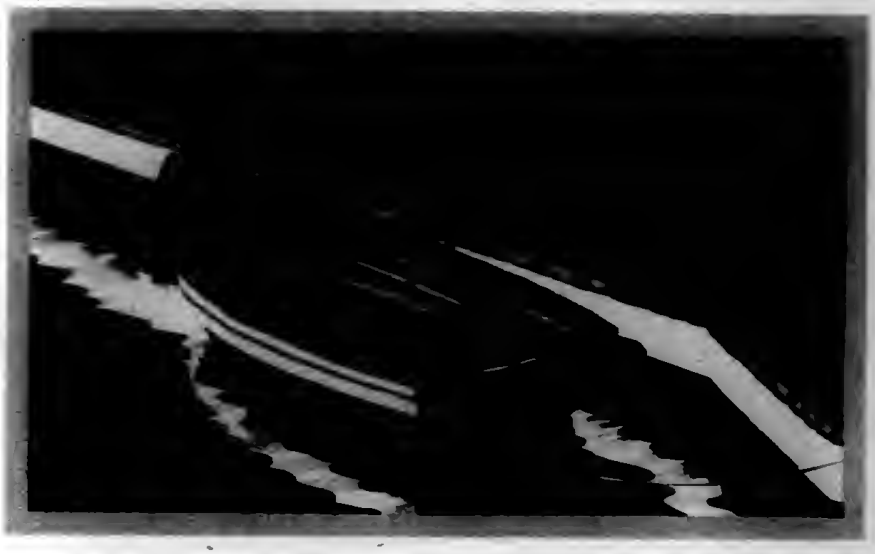
Meanwhile, MapInfo 2.0 from Mapping Information Systems in Troy, N.Y., is a tool for visually organizing data from databases and spreadsheets. You might, for instance, use the product in conjunction with your customer database to search for all sales prospects within 10 miles of an interstate highway.

• **Engineering applications.** Windows has already spawned a wide range of scientific and engineering applications, from statistical analysis to data collection. For instance, the Notebook package from Laboratory Technologies in Wilmington, Mass., collects data from test products or measuring instruments and displays it as a graph or chart.

How do you find these out-of-the-mainstream products? One resource is the "Windows Shopper's Guide," which comes out roughly twice each year and costs $24.95 from Whitefox Communications in Beaverton, Ore.

Berst is the publisher of Redmond, Wash.-based "Windows Watcher" newsletter, a monthly briefing service for software executives and corporate technology managers.

Document image management. If it seems like a logistical nightmare, look at the picture. Close your eyes. Take a deep breath. This is about as complicated as we get.



If you're considering a PC-LAN document imaging system for your firm, it can be very confusing. Now you can deal with one team of experts, supported by one comprehensive product line. LaserData. Our team designs, refines and installs every imaging system and component we sell. Our open architecture makes integration simple and easy on your existing computer equipment. And our systems are modular and flexible, so you can add on when the time is right, with no fear of obsolescence. You get imaging that's reliable and profoundly compatible. With more than 1,000 systems installed in 30 countries, it's no wonder businesses and governments trust us. They like to keep things uncomplicated, too. Call or write us for more information. It's probably the most relaxing thing you'll do today.

LaserData.
The choice is simple

LaserData is a registered trademark of LaserData, Inc., 300 Vesper Park, Tyngsboro, MA 01879 • 508-649-4600 Fax 508-649-4436
See us at IMAGING EXPO, Booth 622, September 15-17, 1992, Jacob Javits Center, New York.

Automation speeds firm's trading program

BY THOMAS HOFFMAN
CW STAFF

NEW YORK — Rockrimmon Securities, a privately held securities trader on the New York and American Stock Exchanges (NYSE and AMEX), is one of the first companies to take advantage of fully automated program trading, and the firm is seeing immediate results. Since the company began using customized software to facilitate its trading nine months ago, its trading volume soared 100%.

"It makes us much more competitive than we were," said Jeff Wilson, a general partner at Rockrimmon, which trades more than 1 million shares per day. By converting from a manual execution order system to an automated trading system based in large part on personal computers, Wilson said, the firm is often the first to place orders at the exchanges.

Last December, Rockrimmon began installing a program trading software system developed by The Davidsohn Group, a New York-based facilities management and outsourcing service bureau for the banking and financial services industries. The system, called the Davidsohn Order Execution System, runs on Rockrimmon's PCs, which emulate Stratus Computer, Inc. terminals.

Once traders have logged on to the system, they can "hot key" between a simultaneous display of updated market data and analytics. The system also produces on-line reports, including average prices of shares traded, Securities and Exchange Commission fee calculation, trade details and net proceeds.

Trading through terminals

Rockrimmon traders using PCs are connected by leased lines to Davidsohn's Stratus XA 2000 Model 120 fault-tolerant host. Rockrimmon traders are then able to place single or multiple orders through their terminals. Trade data is routed by the Stratus minicomputer through an IBM 3270 connection via leased lines to the Securities Industry Automation Corp., which houses computer operations for the NYSE and AMEX.

Before installing the software, Wilson said, Rockrimmon would have to phone one of its clerks on the floor of the exchange in order to page a nearby stock broker, a function that usually took at least two minutes, Wilson said. Using the Davidsohn system, Rockrimmon has eliminated the need for a "middleman" or stockbroker. Orders are now executed within seconds, which Wilson said helps make his firm more competitive. "Whoever is fastest in placing an order with the New York Stock Exchange sells the stock first," Wilson said.

Wilson said he realizes that other firms will soon be moving to program trading. "It's definitely the wave of the future. Eventually, everyone's going to have one of these [electronic trading systems]," Wilson said.

Davidsohn's DDX system is available immediately. Pricing is determined by order volume and terminal installations.

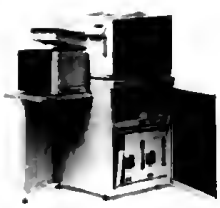
Choose accessories that keep pace with the fast HP LaserJet IIISi printer.

With the17-page-per-minute *HP LaserJet IIISi printer*, it takes less time to print a page than to walk over and take it out of the printer. It's perfect for shared or networked environments.

Now you can add accessories designed to make your high-capacity printing solution even more productive. The new 1,500-sheet *HP paper feeder* lets your HP LaserJet IIISi printer and the people using it get more done between refills. And switch between paper trays without getting up

Your company will save even more time by keeping paper, toner cartridges, and other supplies in one convenient location—underneath the printer. The *HP LaserJet printer cabinet* is roomy on the inside, compact on the outside. It was custom designed to match the footprint of the HP LaserJet IIISi printer with an HP paper feeder. Exactly.

Get your company's high-capacity printing solution off to a flying start. See your authorized HP reseller or contact your HP sales representative about the HP LaserJet IIISi printer and custom accessories. For more information call 1-800-752-0900, ext. 7009.



Enhance the high-capacity HP LaserJet IIISi printing solution with the HP C2921A paper feeder, and the HP C2917A LaserJet printer cabinet.

HEWLETT PACKARD

Windows report writer debuts

BY CHRISTOPHER LINDQUIST
CW STAFF

An area where graphical user interfaces have an advantage over text-based interfaces is in those pursuits that are graphical to begin with. One such endeavor is report writing. Now the largest dBase-compatible report writer has entered the graphical fray with a Microsoft Corp. Windows-based version of its product.

R&R Report Writer for Windows from Westboro, Mass.-based Concentric Data Systems, Inc., allows users to query a database and graphically create and preview a report that can then be printed. Multiple database tables can be linked, and reports can be saved and reused. A variety of spreadsheet-like functions, such as subtotals and totals, can also be applied to the data before the report is printed. A royalty-free runtime verison of the product is also available for developers.

"Users expect things to look professional, and database reports should also," said Michael Davis, network administrator at Robert Mondavi Winery in Napa, Calif. R&R Report Writer for Windows makes that easier, he added. However, graphical report writers are becoming more commonplace. Pioneer Software has a Windows version of Q+E, and several Windows database managers, such as Software Publishing Corp.'s SuperBase, have report writers built in.

"I think it stacks up quite favorably to the competition," said Chris Le Tocq, senior analyst at Computer Intelligence/Infocorp in Santa Clara, Calif. Plus, "they have the name and the developer base so they have some momentum," he added.

Concentric also announced Version 5.0 of its DOS-based R&R Report Writer for Xbase.

R&R Report Writer for Windows is scheduled for availability next month for a list price of $249. Version 5.0 of the DOS product is available immediately for $249. Current users of R&R Report Writer can upgrade for $99.

CUSTOMERS RATE CABLETRON NUMBER IN SUPPORT

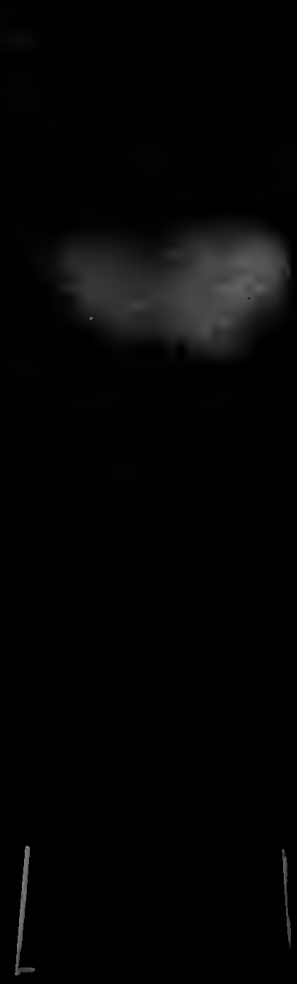
At Cabletron Systems we don't just sell networking solutions we forge partnerships with our customers We work with you before, during and after the sale, helping you install and configure new equipment train your people, and develop solutions as your network—and networking needs—continue to expand

We have the technology to get your network up and running as efficiently and economically as possible And we'll keep it running with the largest, most dedicated technical support staff in the industry

Two out of five Cabletron employees are dedicated solely to customer service and support 98.6% of all technical service calls are resolved on the first incoming call—a statistic unmatched in the industry.

On the phone, on the road, on-site, we're there, supporting our systems twenty-four hours a day, seven days a week

To learn more about Cabletron's *Complete Networking Solution,*™ give us a call at (603) 332-9400, Ext. 2704.



[illegible] committed to providing us with the networking services and support we need Cabletron has provided single source solution including everything from products to service

[illegible]

We had some questions about our network so I called our Cabletron salesman A moment later I was amazed to hear Bob Levine the president of Cabletron on the [illegible] asking me for details on the situation Bob promised *and delivered* complete solution to the problem within 24-hours

"I might have expected that kind of service if we were a multi-million dollar client but we're not [illegible] kind of attention to a fair [illegible] client that helped me make [illegible] decision to stay with Cabletron [illegible] our future network [illegible]

FORGING THE FUTURE OF NETWORKING

CORPORATE HEADQUARTERS • [illegible] NEW HAMPSHIRE 03867-0505

HELP LINE

Part of a series of user tips provided by personal computer software vendors and based on questions commonly asked of their customer support personnel. This week's focus is on Lotus Development Corp.'s 1-2-3 for Windows.

Q When I print from 1-2-3 for Windows to my color PostScript printer, it prints shades of gray instead of colors. Can 1-2-3 for Windows print in color to my printer?

A 1-2-3 for Windows uses its own internal PostScript driver as a default. This driver does not support color printing. To print in color, install the Windows PostScript printer driver under Printers in the Windows Control Panel and edit the 123W.INI file so that the line "postscript=" reads "postscript=system." Changing this line in the 123W.INI file will tell 1-2-3 for Windows to use the Windows PostScript driver.

Q Where do I select how many copies of my worksheet are to be printed from 1-2-3 for Windows?

A 1-2-3 for Windows determines the number of copies to print by the Copies setting in File, Printer Setup, Setup. This setting configures the printer driver for the number of copies. The printer driver contains the Copies setting. However, not all of the Microsoft Corp. Windows 3.1 printer drivers have a Copies setting. Typically, the Windows Laser and PostScript printer drivers include this capability.

1-2-3 for Windows

Q I don't see any of the Windows 3.1 TrueType fonts when I look in the "Available Fonts" section of the Style Fonts Replace dialog box of 1-2-3 for Windows. Can I use TrueType fonts?

A 1-2-3 for Windows 1.0 and 1.0a will not show TrueType fonts as being available if the current printer selection in 1-2-3 is not a laser printer. You can use TrueType fonts with the latest version of 1-2-3 for Windows. The 1-2-3 for Windows 1.1 Update is available free of charge by calling Lotus at (800) 872-3387, Ext. 6616.

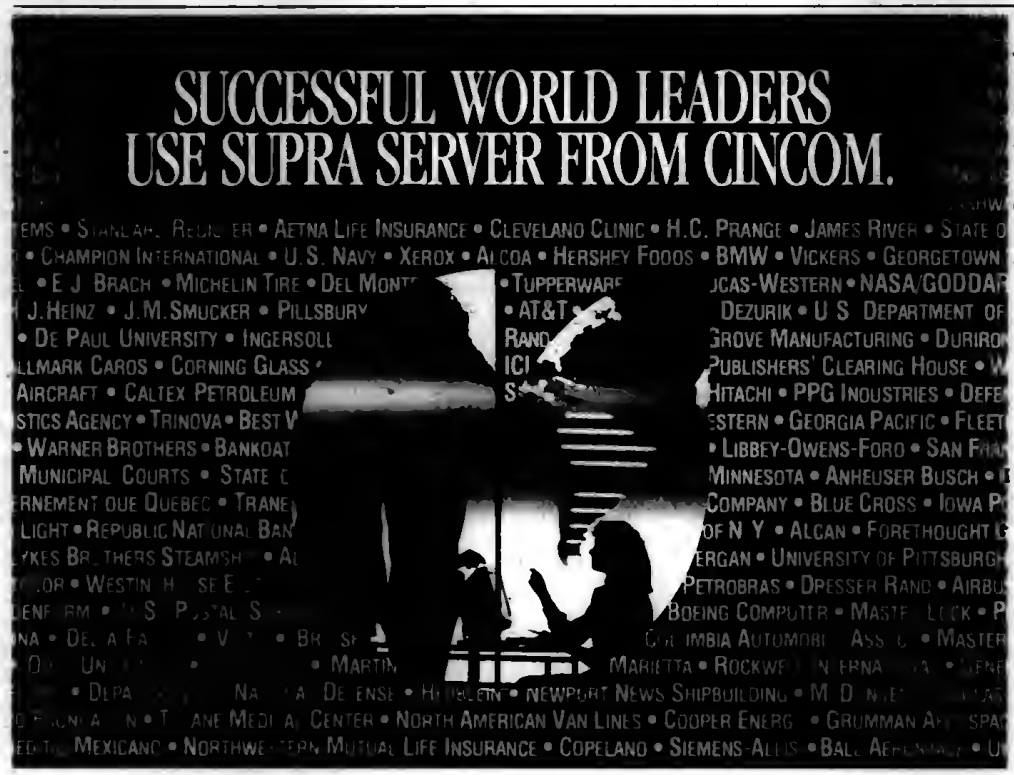
Q How can I underline a word in a cell in 1-2-3 for Windows with a double line?

A Click on the cell with the mouse and select Style, Border. Then click on the box next to Bottom, click on the down arrow, choose the double underline and click OK.

Q How can I print a graph in 1-2-3 for Windows?

A To print a graph in 1-2-3 for Windows, it must first be added to the worksheet. Select Graph, Add to Sheet, select a range in the worksheet where you want the graph to be placed and click OK. Specify the range by highlighting it with the mouse, and click on the Printer SmartIcon to print the graph.

SUCCESSFUL WORLD LEADERS
USE SUPRA SERVER FROM CINCOM.



Try SUPRA free, and you'll see why over 600,000 SUPRA users can't be wrong.

Thousands of companies all around the world have discovered the best quality, best price, best value and best success with SUPRA™. Today's SUPRA is a proven, SQL-based, high-performance, relational database that runs across all platforms... from the largest MVS/ESA mainframe to VSE to Digital VAX to UNIX to the PC. With SUPRA, applications can be designed and developed on any platform, deployed to any other platform, or connected in a Client/Server network. And, the open architecture of SUPRA allows you to keep up with changing data needs, and easily integrate future technologies. SUPRA is backed by comprehensive service, support and education from Cincom, a pioneer and leader in the software industry since 1968, with over 1,000,000 users in over 5,000 locations worldwide. Call today for a free trial of SUPRA, or a free copy of the latest MIC® Data Base Product Report on SUPRA, and you'll see why successful companies are making **The Smart Choice.**

SUPRA FROM CINCOM The Smart Choice™

FOR A FREE TRIAL OF SUPRA CALL 1-800-543-3010 • In Canada 1-800-387-9328

NEW PRODUCTS

Macintosh products

Agfa, the imaging division of Miles, Inc., has announced Version 3.1 of AgfaType CD-ROM, a type collection for Apple Computer, Inc. Macintosh users.

Version 3.1 offers more than 200 new typefaces, bringing the number of Adobe Systems, Inc. PostScript fonts that the product provides to more than 2,000. Two new Agfa type applications are included. KernEdit is a professional kerning editor, and TypeChart is a type speciman generation software package.

AgfaType CD-ROM Version 3.1 costs $99.

Agfa Division, Miles, Inc.
90 Industrial Way
Wilmington, Mass. 01887
(508) 658-5600

White Paper

LEADERSHIP

EDI
pure and simple

Leadership *def. "ability to lead"* and as systems integrators of applied communications technology, we've demonstrated our leadership abilities on over 300 projects in 50 countries worldwide.

Application to Application

Our modular ***EDI*** system solutions not only minimize implementation time but also are designed to grow, concurrent with electronic media enhancements and integrate fully to your applications. So your needs are never restricted, your system is never "out of date."

Unique Mapping Capabilities

CANAC software integrates to your present system to manage both stand alone and multiple ***EDI*** trading partner strategies with one software solution, and with any recognized standard.

Network Facilities

The strength of CANAC's strategic network alliances provide you with global accessibility and comprehensive network interconnectivity through local dial-up.

Efficient Training & Support

Inclusive installation and individual training is supplied through local first level support personnel with constantly accessible secondary support facilities.

CANAC Telecom provides the proper software support in response to your needs. The result is cost effectiveness through increased productivity. It's pure and simple.

CALL 1-800-668-2784 TODAY

CANAC Telecom
a CN operation

Responding Globally

Introduction

Electronic Data Interchange (EDI) is not just another IS tool, another step up the technology ladder. With its ability to expedite business transactions between trading partners, EDI can promote commerce at a time when the sluggish global economy is dragging commerce down. It is also a boon to companies operating within more vibrant economic conditions, as it allows them to compete even more effectively.

As a result of its unique user-driven nature, EDI has evolved in strict accordance with the needs of a variety of vertical industries, each of which has tailored its technology to meet proprietary needs. While this freedom is arguably the purest expression of technology put to productive use, it has also led to a melange of EDI "standards".

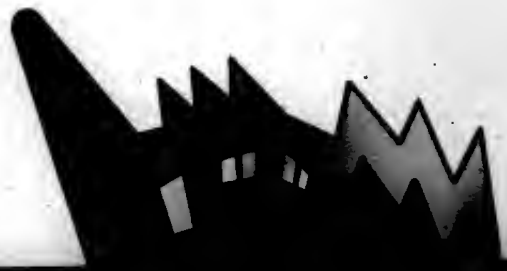
Although efforts are in progress to unify users under one banner, a host of domestic and international obstacles — many not related to standards — must be overcome.

One of the most pressing and longest-running of those obstacles is the disparity of benefits EDI offers its varied constituents. In what has developed as a "haves" versus "have-nots" scenario, major retail and manufacturing companies that have implemented EDI are seen as forcing it on their suppliers, many of whom lack the resources to establish profitable EDI frameworks.

Although it is easy and appropriate to laud EDI for its potential as an economic catalyst, it does require attention on a technical level. Compared to other currently prominent technologies such as facsimile and imaging, EDI has a major advantage in that it is readily accessible for other applications.

As with other user-driven technologies such as personal computers, EDI has grown faster than IS' ability to obtain its full benefit. Now, IS is trying to provide broader and more integrated solutions that will allow users to get the most out of EDI while staying within the corporate IS structure.

Perhaps it is a good sign that so much attention is being paid to eliminating EDI's obstacles. That seems a sure indication that its ultimate success will be far-reaching.



This White Paper was written independently of the Computerworld editorial department by Paul Zorfass and Caroline Michel of International Data Corp. Zorfass is a consultant director at IDC. Michel is a senior analyst in communications.

For more information on the White Paper Program, please call 508-879-0700.

EDI (Electronic Data Interchange) is as much an evolutionary catalyst for continuous business improvement as it is an IS technology. EDI is unique in that it combines critical elements of data processing, business processes and communications.

EDI is a worldwide phenomenon that provides the infrastructure necessary for mission-critical transactions. It is being aggressively implemented and backed by national governments in the U.S., Canada, Europe, Asia and the Pacific Rim (Asia/Pacific). EDI has the potential to spur economic development by facilitating commercial transactions.

EDI is defined as the computer-to-computer interchange of business transactions that conforms with specified standards over a communications network that includes at least two trading partners. These transactions include the interchange of common commercial informa-

tion typically consisting of purchase orders, invoices, shipping notices and related acknowledgements. There are some special EDI characteristics that differentiate it from other processes and business solutions.

Most notably, EDI has been more user-driven than any other automated business solution. This has been advantageous for users because they have not been constrained by IS. They realize that characterizing EDI as a file transfer utility or as document-to-document interchange creates the wrong impression, one that does not portray the significant business benefits of EDI. Conversely, the user-driven nature of EDI has been disadvantageous to users because they lack the architectural and implementation coherence required by complex IS systems.

EDI growth has been bolstered by its appeal to some 30 vertical industry markets, each of which has become involved in specifying EDI standards for special interest organizations within that vertical industry. However, this vertical market appeal has undermined efforts to create a unified EDI standard. This situation has only recently been addressed by X12-Data Interchange Standards Association (X12/DISA). X12/DISA is the umbrella group for U.S. EDI standards, as chartered by the American National Standards Institute (ANSI).

The business and technology issues associated with EDI require special attention to project management, intra-enterprise cooperation and relationships between customers and suppliers. Companies that focus on these areas will realize competitive advantages.

The interchange of business information creates an extended enterprise environment. If the enterprise is viewed as a hub of activities, its trading partners can be viewed as spokes. Hubs represent the accumulation point for transactions from multiple trading partners. An example is a 350-store supermarket chain receiving direct store deliveries from its suppliers at all locations.

Typically, a larger spoke organization, such as a General Electric, RJR or Kodak, will be the hub for its own supplier network. Hubs have more specification power than spokes, which can lead to tension between the two trading partners.

MARKET SIZE AND MEASURES

Although the EDI market is worldwide, it originated in the U.S. and continues to enjoy most of its popularity here. The EDI market is comprised of three components:

- EDI software
- Data transport/network services
- Professional services.

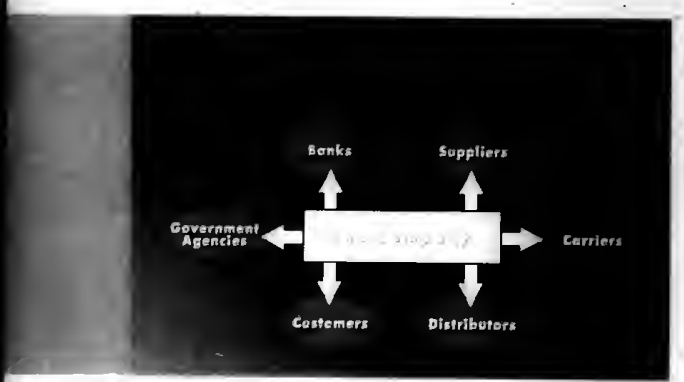
IDC estimates that the EDI revenues for these three components in the U.S., Europe and Asia/Pacific was $368 million in 1991. This figure is expected to reach $1.8 billion in 1996. This represents a compound annual growth rate of 37%. The projected growth by geographic trading area is 35% for the U.S., 36% for Europe and 48% for Asia/Pacific.

There are other parameters for measuring EDI's impact. For example, the banking community tracks the processing of EFT (Electronic Fund Transfers) transactions by the National Automated Clearing House. This is an excellent measure of how EDI is performing in the banking community. The best measure is the Corporate Trade Exchange (CTX) EFT transaction since it is compatible with the X12 ANSI EDI standard for remittance advice.

CTX transactions can automatically be processed from the automatic clearing house into a business's own EDI system. It is used for more than one invoice/payment. While the total number of transactions is modest, from the fourth quarter of 1990 to the fourth quarter of 1991, the number of CTX transactions processed went from 37,000 to 79,000, a growth of 114%.

The organization, "EDI, Spread the Word!", publishes the EDI Yellow Pages, listing EDI users. In July 1991, there were 21,000 registered users in this directory, and in July 1992, there were over 31,000.

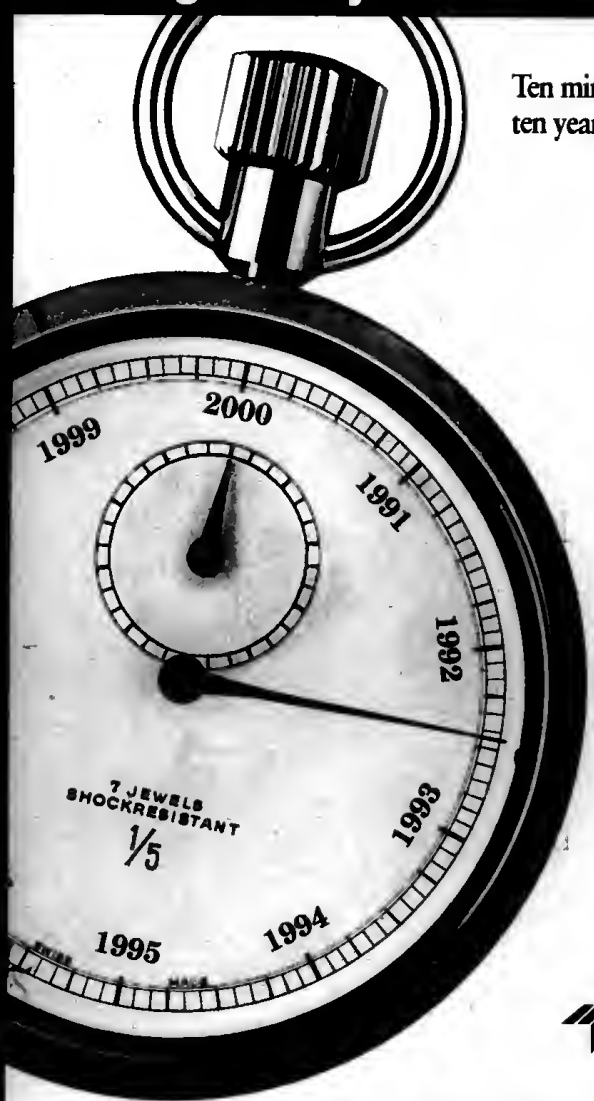
The number of draft standards that X12/DISA has released for trial use over the last five years (excluding redundant transition standards) is steadily increasing. Maintenance activities continue at an active pace, showing interest and desire by users to make the standards more congruent with business practices.



EVOLVING BUSINESS AND IS PARTNERSHIPS IN THE '90s

Information technology trends such as downsizing and rightsizing are dynamics in the ever-changing relationship between IS and its business partners. As a result of such trends and economic imperatives, IS is being attached more securely to lines of business. Through all of these changes, IS must continue managing its high value-

Give ten minutes to us. And get ten years on them.



Ten minutes with Tandem can put you ten years ahead of your competition.

Because, while they're still trying EDI on yesterday's computers, you can be doing EDI on the only system ready today for the commercial messaging challenges of tomorrow.

Only a Tandem solution can meet the EDI needs of one department now—and expand to meet your entire company's full range of messaging needs years from now. Step by step, cost-effectively. All the while supporting information exchange between you and your trading partners 24 hours a day, 7 days a week.

Tandem is the leading supplier of event-driven, online solutions for electronic commerce. Our NonStop systems are the platform of choice for seven out of ten value-added network service providers in the U.S. We have customers already using 1988-compliant X.400 networking. Connect through us, and you can connect to virtually anything.

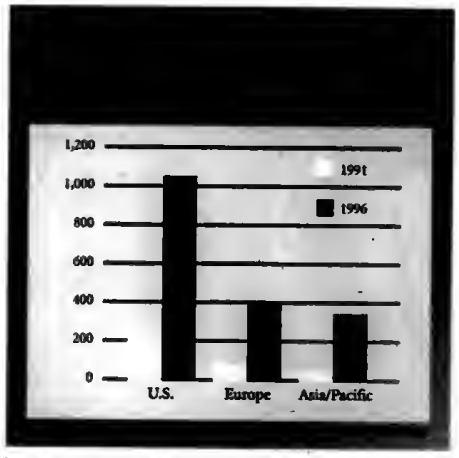
So leave your competition ten years behind. Ten minutes with our EDI Information Pack will show you how. Just call 1-800-482-6336 (U.S.) or 1-800-345-8636 (Canada), and ask for it.

TANDEM

Tandem, NonStop, and the Tandem logo are trademarks of Tandem Computers Incorporated.

added, legacy systems (typically IBM and plug-compatible mainframes). This must be done in the face of new computing architectures, alternative software solutions, workgroup solutions and flexible infrastructures. At the same time, business management and IS are managing the ever-changing hierarchy of trading partner needs.

Senior IS executives need to keep in mind that there is a wide diversity of technology experience and planned technology funding for EDI. Smaller spoke organizations typically underfund EDI and put EDI solutions on dedicated PC platforms. While this approach meets the hub requirements, it does not allow the spoke/supplier organizations to realize the full range of EDI benefits.



Some advanced technologies such as fax and imaging which contribute to expanding electronic commerce are not yet ready for interoperating with current systems at all levels. If any data from a fax or image transmission needs changing, the entire fax or image must be retransmitted. With EDI, changes can be made on a transaction basis. While fax and image systems are sometimes simpler to utilize, their data is not readily accessible for other applications. By comparison, EDI's business transaction set opens EDI data to a wide variety of uses.

Enabling application software that allows EDI systems to operate in a variety of trading environments is critical. IS has prior experience with DBMSs, as a requirement for flexible data management: CASE, as a requirement for quality application development; electronic mail, as a precursor for continuous office communications; and 4GLs, as a requirement for responsive decision support systems. Similarly, EDI is a requirement for managing the business organization for business process flexibility. As IS implementors understand, the challenge to building responsive systems is often directly related to the interfacing and interoperability functions.

TWO UNDERLYING EDI THEMES

EDI is a response to two underlying business themes, time-based business solutions and stakeholder-responsive solutions. This is the implicit motivator shared by such diverse EDI organizations as the Big 3 automakers, Sears, McDonalds, UPS, transportation port authorities and the Department of Defense. When it comes to time-based business solutions, the Japanese have shown that companies can control markets if they can first control their own companies, squeezing down the cycle times to complete tasks, while still not losing quality or accuracy. This means reducing paper, handling, filing and storage. Perhaps most importantly, it means reducing barriers to moving information and physical goods.

Currently, there are two noteworthy business practices in the U.S. that are particularly productive corollaries of time-based management solutions. EDI is conducive to both of them. The first, Just-in-Time (JIT), is a manufacturing strategy designed to reduce physical inventory and its associated costs, while managing a smoother interface between manufacturers and suppliers. This has spurred increasingly productive approaches to factory layout and design, production lines, transportation, bar coding and distribution.

The second, Quick Response (QR), is a retail strategy, prominent in grocery/supermarket chains, designed to rapidly respond to customer buying patterns that are captured through point-of-sale (POS) checkouts. QR has led to such improvements as direct store deliveries, turnover management and earlier staging through advanced ship notices.

The ability to achieve best-in-class status, or even be recognized in an individual trading area as a company that other companies want to do business with, is a function of how well each company manages its separate audiences. These audiences consist of customers, suppliers, and employees. Since EDI establishes the infrastructure for electronic commerce by managing interfaces between companies, it improves stakeholder relations with customers and suppliers.

Managing the employee stakeholder is complex. Since EDI is almost always a change agent in the company, and since change is usually not comfortable for organizations, the scope, schedule and areas for application all require careful attention. Within many organizations, it is often the sales people who are the most concerned with the impact of EDI, since EDI forces them to become better business planners.

CONCEPTUAL MODEL ARCHITECTURE

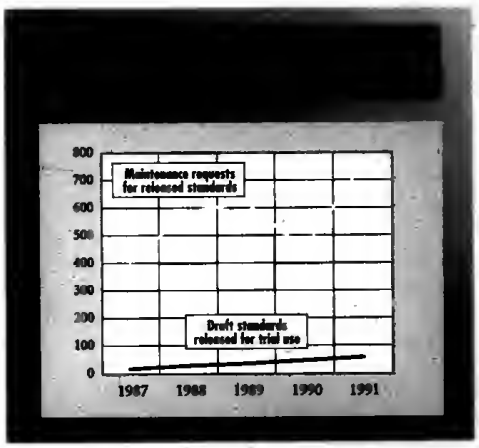
While EDI use is growing rapidly within a diverse community of private and public users, architectures and universally accepted and understood models have lagged. While this may not have

hindered the rate of growth of EDI, it is becoming a more important issue as organizations work to achieve more critical paybacks from EDI.

It is also becoming more important for several other reasons.

- EDI is being deployed in a global environment marked by extreme differences in culture, business practices and approaches to problem solving
- More interactions are taking place outside an organization's primary trading group, with new partners, new practices and new language syntax
- The use of EDI as it relates to EFT and invoiceless payments is becoming more complex. This will force EDI hubs and spokes to communicate more precisely about critical points
- There is accelerating penetration of current EDI user organizations such as transportation companies, governmental agencies and banks. This means that education and training will grow in importance.

The initial development work for a conceptual model containing EDI standards and services was completed in mid-1991 by the Special Working Group on EDI under the auspices of the International Standards Organization. The objective of the group was not only to develop a conceptual model to identify and coordinate present and future standards and services, but to make it internationally acceptable.



FOUR SUCCESS FACTORS

The four overarching critical success factors for EDI are business process reeogineering; standardization and infrastructure; automation and flexible computing; and integration and interoperability.

Business Process Engineering

The critical factor of business process reengineering, or redesign, was popularized by companies socb as CSC/Index, Andersen Consulting, Erost & Young and Nolan Norton. The approach is a methodical, often structured, approach to initiating fundamental organizational change by means of critically evaluating business activities. There is a discarding or reworking of ineffective or unessential processes. New approaches are built that utilize new technology, where appropriate, to achieve major breakthroughs in improved business performance.

Often the problems are larger than initially anticipated, sioce business problems do not usually fit into neat slots. For a computer systems manufacturer there may be multiple manufacturing systems, each having a different set of requirements, that need to be interfaced at different locations. For a large manufacturing plant there may be multiple power plants each with railroad sidings for coal delivery, and the need to differentiate and cost differently since they use different grades of coal.

In the drive to become more efficient and reduce expenses through EDI, inventory reduction is often a target. This example can be the cause of significant concern, especially for the plant manager who has the ultimate responsibility for operations at the plaot level, and wbo may see himself and his safety stock as both a beneficiary of, and a captive to, JIT solutions.

Standardization and Infrastructure

The first major area for standards involves messaging for the transaction transport and interchange over the communications network. The EDI roots for these are X.400 standards that were originally designed for electronic mail. The majority of current X.400 products is based on the version adopted in 1984. At that time, there was no explicit addressing of EDI requiremeots. Interim solutions have since been introduced by the National Institute of Standards and Technology (NIST) and the Consultative Committee for Telepbone and Telegraph (CCITT).

The most critical EDI standards-related activity currently revolves around development of the X.435 standard, which facilitates EDI transactions over X.400 oetworks. X.435, which is still at least two years from implementation, defines a new EDI content type that uses the feature-laden services that are part of X.400. Additionally, as X.500-based directory services are better defined, tbe function of software translation and connectivity products for the deployment of EDI across networks will improve.

"Enabling application software that allows EDI systems to operate in a variety of trading environments is critical."

As an interim measure toward achieving improved network interconnection, the ANSI X.12.56 Interconnect Mailbag structure is being implemented by value added networks (VANs). All major U.S. VANs are committed to a rapid implementatioo of the Mailbag

AT&T EDI.
Electronic Data Interchange.

AT&T EDI not only lets your computers "talk" with all your business partners' computers, but it can also help your business run faster, smoother and far more efficiently than before.

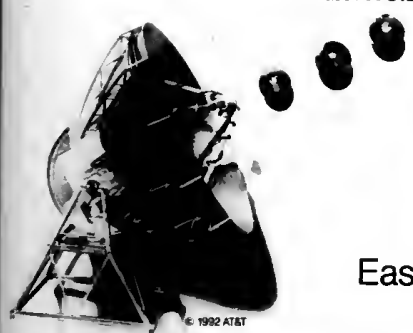
AT&T EDI is a specially configured messaging network that allows different computers to exchange information, such as purchase orders, invoices and even computer-generated images back and forth in an entirely paperless transaction. And since the entire process is electronic, it all happens almost instantly.

By linking up to your business partners with AT&T EDI, you'll not only save a tremendous amount of time and reduce data entry errors, but you can almost virtually eliminate lost documents and unnecessary paperwork and ensure the security of all your information.

How to get your computer to have more productive

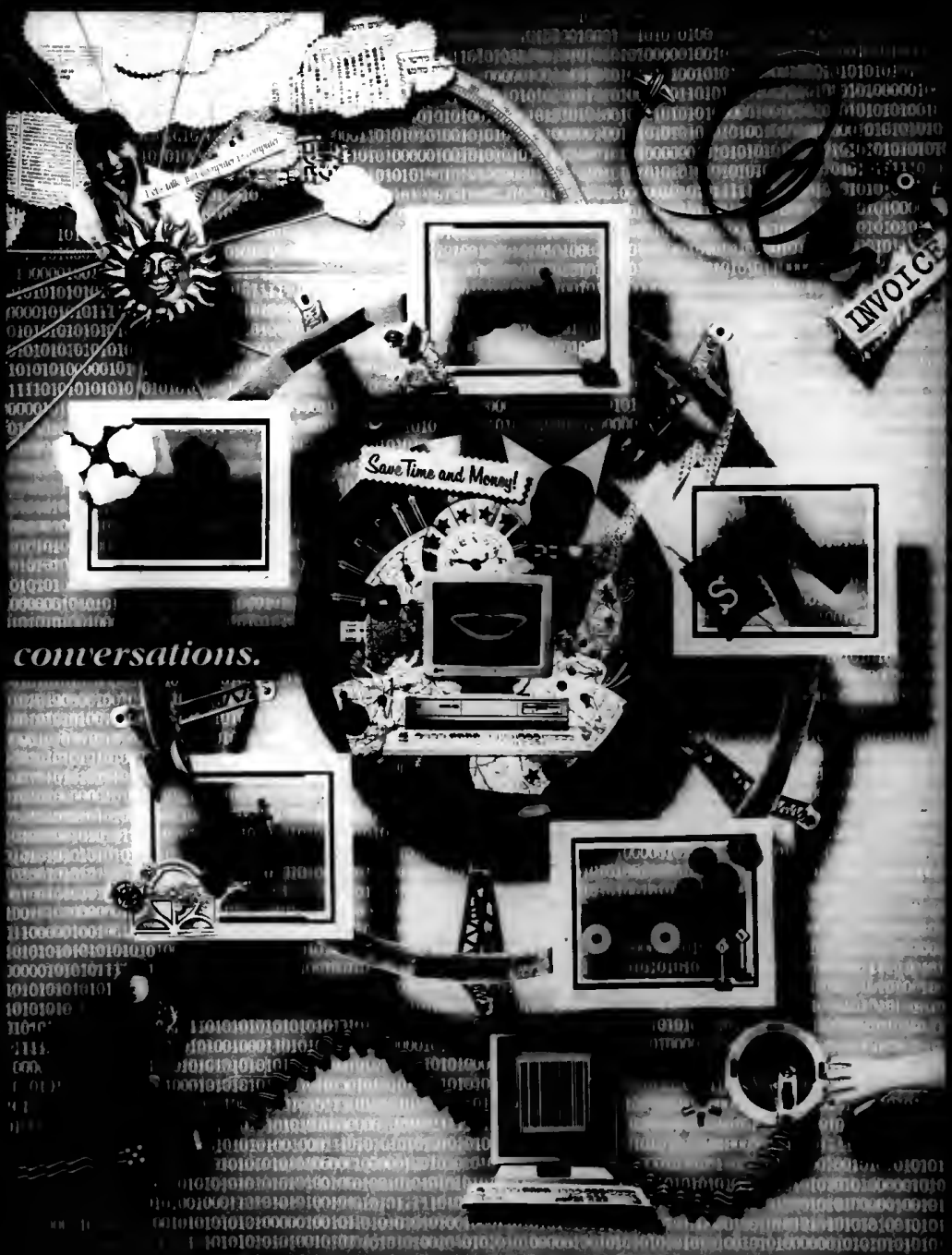
AT&T EDI is just one of the many electronic messaging solutions offered by AT&T EasyLink Services. Together they can provide the answers for all your U.S. and global business communication needs and help you *see, hear* and *say* things you never could before.

For additional information on how AT&T EasyLink Services can help you with all your various information movement needs, call your account representative or AT&T EasyLink Services at 1 800 242-6005, Dept. 5308.



© 1992 AT&T

AT&T
EasyLink Services


Save Time and Money!
INVOIC
conversations.

standard with the goal of implementation by the end of 1992. This will improve transaction handling and message management. This is true even though Mailbag provides only one interconnection acknowledgement for multiple transmission steps, does not have full audit trail capabilities, and does not provide for real-time, event-driven EDI as does X.435.

The second major area for EDI standards is the content of the transaction or document itself. This is application oriented. Industry trade groups started by establishing their own standards to address their special needs. In the U.S. these standards now fall under the ANSI X12 umbrella. While over two-thirds of EDI users in the U.S. utilize the more generic X12 standard, many also still have unique requirements for subordinate special interest standards. Some of the established trading standards are: WINS for warehousing, UCS for supermarkets, TDCC for transportation, VICS for department stores/mass merchandisers and AIAG for automotive manufacturing.

"VANs must offer a high level of service, including effective help desks and rapid problem resolution."

"Industry trade groups started by establishing their own standards to address their special needs."

DISA has established uniform procedures for the adoption and distribution of standards, especially for groups of interested parties with structurally different business organizations. It is not likely that these diverse standards will ever be totally homogenized since trading groups always have unique business needs.

In addition to X12, there are primarily European standards that are being developed under the auspices of the United Nations and known as UN/EDIFACT (EDI for Administration, Commerce, and Trade), an upgrade to EDIFACT. The usage of the X12 and UN/EDIFACT standards are determined by the needs of trading partners. Although many EDI users do not have any current need for EDIFACT, it is nonetheless required for specific national agencies such as customs.

The UN/EDIFACT standards are not complete, and sometimes documentation is difficult to obtain. Because it is designed to meet generic global needs, it will evolve more slowly than X12 and may be more cumbersome.

It is important to note the U.S. federal government's EDI approach, Federal Information Processing Standard 161 (FIPS 161), was developed under the auspices of NIST. FIPS allows the use of either X12 or UN/EDIFACT. Both U.S. and European groups are working to get these two standards to align with each other within the next five years.

The open, conceptual model discussed earlier will be consistent with X12 and EDIFACT, since it does not plan to use specific syntax of either nf these groups. This model could start EDI down a patb toward a broad, unified methodology that will favor less sophisticated spoke users.

When discussing standards, be advised that trading sector standards may change as frequently as once or twice per year depending on each committee's actions and on tbe balloting by DISA membership.

The communication network is a very significant portion of the EDI infrastructure. As the most common EDI carriers, the VANs play a critical role in electronic data transport and interchange. Like standards, VANs often have a trading group heritage, although they have subsequently broadened considerably. For example, BT North America (the acquirer of Tymnet) has a background in the grocery area; TranSettlements has a transportation history.

Overall there are some dozen or sn VANs active in providing both generic and specialized EDI services in the U.S. and Canada. They include GE Information Services (GEIS), IBM Information Network (IBM IN), AT&T, CANAC Telecom, Harbinger EDI Services, I fonet, Kleinschmidt, MCI, RAILIN Sprint, Sears Communications, an Sterling ORDERNET.

The European and the Asia/Pacif markets are actually multiple counti markets. The U.K. has the most well d veloped EDI infrastructure in Europe. I the U.K., International Network Servic (INS), which is partly owned by GEI and AT&T/ISTEL are the leaders; i France, GSI, a leading European profes sional services company, and GEIS dom inate. The German market is controlle by GEIS. EDI is moving at a slower pac in the other European countries.

In Asia/Pacific there is a two-tier mar ket. Australia, New Zealand, Singapor and Hong Kong bave well-developec EDI infrastructures. Japan, Taiwan, an South Korea have been late starters i EDI.

VANs are often the most practical rapid and secure solution to communi cation network needs. There are tbre important areas for users to conside when evaluating networks for EDI use The first is secure data transmission. It i necessary to know if data packets reach the trading partner quickly enough Users also need to know what sort o functional acknowledgement capabilit has been established to provide an audit trail for the transactions. Beyond that, it is important to find out what backup and restart mechanisms are available when links or central nffices are impaired.

It is also important to check out what type of archiving is provided and for how long. Are transactions just lost after one week? How well does the VAN plan and execute disaster recovery? When was the last time that disaster recovery was tested?

The second networking area to consider is interoperability. Since many trading partners will not be on the same VAN, interoperability between VANs and managing the security of the transactions over tbe multiple VANs is critical. These are the issues that the Mailbag protocol and X.435 are designed to solve.

FINALLY...EDI COMES OF AGE.

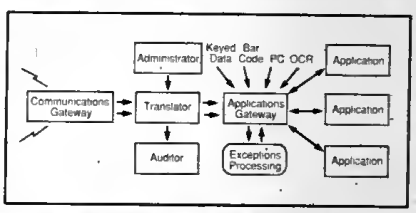
For centuries, information exchange between customers and suppliers has been vital to the art of doing business. Today, business partners are putting a new form of interchange to work...EDI.

The major benefits are realized by those who successfully integrate EDI into their businesses, for:

- Quick Response
- JIT/Continuous Replenishment
- Invoice-less Payments

Integrating EDI into business systems makes it all possible. But until now, effective integration has required costly programming and ongoing maintenance to cope with change.

Now, an innovative new approach simplifies EDI implementation and **reduces the cost.** Using **Trading Partner®** and its Applications Gateway™, you go beyond merely mapping data to fully preparing data for your applications, even when complex conditional editing is required...**without costly programming.**



***Trading Partner** is the next generation EDI software for IBM mainframes.*

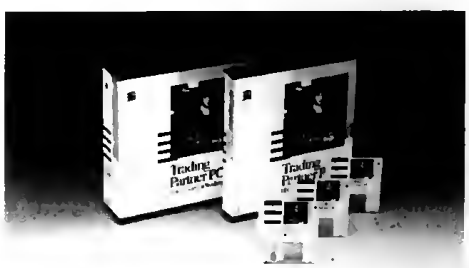
Trading Partner was designed for the nineties...designed from its inception to incorporate all standards from X12 through EDIFACT. Learn how **Trading Partner's** architecture allows for easy integration of EDI data with your on-line CICS systems...how both business and applications intelligence can be applied to EDI data to replace the 'paper path' of your current business documents. Then get your partners up and running quickly with TSI's customized **hub/spoke** program.

TSI International is the worldwide leader in data integration software, serving over 3000 EDI customers. To register for a free seminar, Keys to EDI Success, or to request information about mainframe, PC and hub/spoke software, **call today: 800-338-4194.**

© TSI International 1992

NOW... EDI "KITS" FOR WINDOWS™ MAKE TRADING EVEN EASIER.

The art of doing business can take many forms. If you're a major corporation, your focus is bringing up trading partners at an accelerated pace. If you're a small company, your customers are asking you to trade with them electronically and you need an easy way to begin. Now there is a solution for both — **Trading Partner PC® Kits**, Windows-based EDI software that gets the partnership off to a great start.



Each Kit comes with all of the software and documentation your partners need for reliable, consistent trading. The benefits are clear — reduced effort for you and happy EDI partners at both ends.

FOR HUBS

Trading Partner PC Kits are customized by TSI for *your* EDI program. And they're maintained by TSI as your program evolves.

FOR SPOKES

Trading Partner PC is the ideal blend of ease of use and power. Written to take advantage of Microsoft® Windows 3.0 and 3.1™, **Trading Partner PC** combines point-and-shoot graphics with high-performance EDI processing. It's a universal EDI platform for trading any document, on any network, with any trading partner.

For more information on **Trading Partner PC** or customized Kits for your EDI program, **call 800-334-2120.**

***Trading Partner PC** combines ease of use with high-performance EDI processing under Windows.*

* Microsoft is a registered trademark and Windows is a trademark of Microsoft Corporation.

© TSI International 1990

The third area is customer service. Some VANs still do not realize that there are usually no effective replacement and backup systems available for heavy EDI user companies. VANs must offer a high level of service, including effective help desks and rapid problem resolution. VANs need programs that rapidly profile trading partners for installation and modifications.

Automation and Flexible Computing

The broad family of EDI software fits comfortably with a range of computer platform architectures, operating on mainframes, minicomputers and desktop (primarily DOS) machines. It can be used with both proprietary and UNIX environments. UNIX solutions have been emerging during the last two years. EDI translation software for standardized transaction sets is critically important. As the mission-critical nature of EDI evolves, organizations are making platform decisions that also include fault-tolerant machines. Both large and small organizations are purchasing EDI software.

Present computing platform usage is distinctly polarized. The larger Fortune 500 hub firms are operating in a mainframe environment often with software purchased from independent software vendors like Sterling, TSI, GEIS and IBM.

The spoke firms are typically operating on PCs or minicomputers. They may have only standalone PCs. EDI standards usually have been dictated by the larger bub firms and are predominantly based on X12. Small firms that use EDI only for the communications benefits will often translate and reassemble transactions for paper output delivery to departments such as purchasing, order entry, customer service, manufacturing or transportation/traffic.

Spoke software usually is chosen to be as compatible as possible with the requirements of hubs. Software suppliers focusing on the midrange and the desktop area include Supply Tech, ACS/Premenos, Digital Equipment, EDI Inc., EDS and Harbinger.

The larger hubs typically require rich product sets that accommodate scalability and address risk and reliability areas. The software needs to be table-driven. These tables must also address the evolving nature of X12, UN/EDIFACT and additional services such as bar coding that utilize online Universal Product Code tables.

The VANs also have complex software requirements for message and transaction management services. These services are required to maintain the integrity of the envelope and the transaction set. This integrity may have to be maintained across more than one VAN.

Integration and Interoperability

Managing application integration and interoperability are also critical to EDI success. The term EDI II is used for systems that successfully realize this goal. The integration and interoperability areas have organizational, platform and software components associated with them. The organizational issues are very complex and largely applicable to business process reengineering. Hardware, standards and communications issues are primarily software issues.

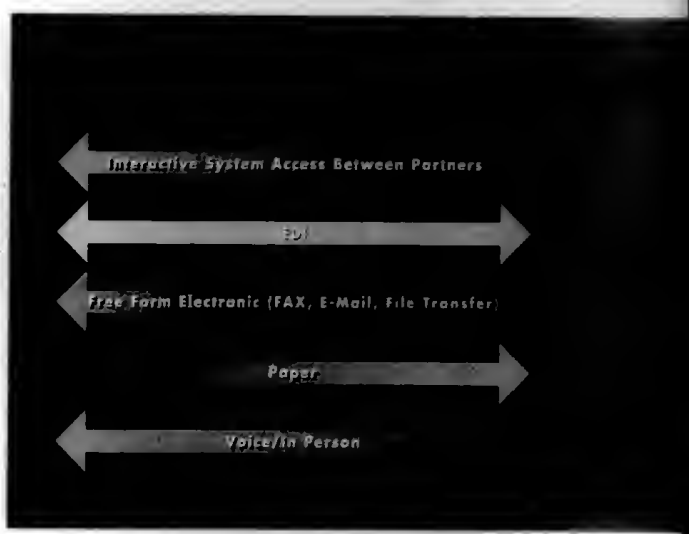
The more seamless and transparent EDI software is to other software, the easier it is to manage accompanying issues such as business reengineering. Software is improving in this area, bnt is not yet standardized. There are several areas that require special attention, including advanced software function, interoperability, network computing, convenient GUIs and time responsive solutions.

THREE LEVELS OF EDI

There are three basic levels of EDI use: end-to-end communications, intraintegration and interexploitation.

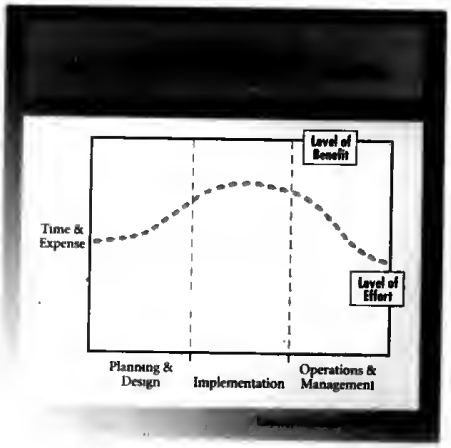
Level 1 — End-to-end communications. This is the foundation installation of EDI. It is comprised of computing platform, translation software and communications links.

Usually PC-based, Level 1 includes an end-to-end transaction delivery system. This is the least expensive approach and accordingly offers the fewest benefits. Transactions received at tbis level may be keyed into otber systems or



turned into paper to be delivered to functional groups. There is no business process reengineering considered here.

The system is viewed by the organization as more of a communications link system than an IS system. Emphasis is on the trading partner-initiated aspects of the system. Usually it has been implemented to respond to a small number of trading partners and a limited number of business applications. Most EDI implementations are of a Level 1 type. Level 1 generally applies to smaller spoke companies as well as low end networks.



Level 2 — Intraintegration. This represents a Level 1 system that interoperates and is integrated with other IS systems. The Level 2 system affects business operations and has a high likelihood to change business practices. Business process reengineering is likely to have occurred at this level. Application integration and interoperability with other systems are the primary characteristics of this EDI level. It is a moderately expensive solution and has the potential for significant benefits when business processes are considered.

The Level 2 system impacts intracompany activities most heavily. Usually a larger number — perhaps hundreds — of trading partners is involved. Level 2 systems have the potential to be mission-critical. Level 2 approaches may extend JIT or QR across the business organization. These implementations are mostly being performed by hub organizations on mainframe systems.

Level 3 — Interexploitation. This is a Level 2 system that is more thoroughly integrated with business practices on both ends of the communication link. Level 3 systems are expensive and need to be implemented carefully over time. Their benefits can be very significant. The trading partners are providing information to each other that was formerly classified as internal information only. For example, a supermarket is sharing its anticipated shelf withdrawals and special promotions with manufacturers who will use the information for their manufacturing production planning schedules.

This level allows trading partners to plan ahead for materials, machine time, capacity and people needed in the future. Level 3 systems are mission-critical systems. Only a few trading operations have achieved Level 3. This group includes a number of transportation companies that have integrated systems with their customers' needs. These systems require trust between partners.

FUTURE EDI DIRECTIONS

While EDI will be more successful if integrated with present application software solutions as Level 2 EDI applications, the most lucrative EDI payoffs will come from finding new ways of doing business. Examples may include tieing EDI directly to scanners to take advantage of bar code inputs, or reducing complexity of purchasing systems by building advanced shipment solutions that require only P.O. release numbers. Another example may be simplifying payments to trading partners with advanced receipt and settlement systems. These systems will maintain tight audit trails but, let workers focus on system effectiveness rather than system efficiency.

Currently it is common to schedule batch EDI applications at various times. In some industries this batch orientation will change to real-time and event-driven transmissions that require the time-critical capabilities of EDI.

Although communication carriers such as AT&T, MCI, Sprint and the regional Bell operating companies are in their early startup stages for EDI, VANs may expect greater competition here once the carriers better understand the requirements of EDI. There is a challenge to carriers to become more than just a voice or data communications network offering customers wide area connections. Carriers have the opportunity to become more deeply associated with customers and their business activities by managing EDI transaction sets. They also have the opportunity to provide enhanced services that extend present voice and data communications infrastructures and offerings significantly.

T D C C

EDIA

20 years of leadership

GREGORY B. HARTER
President and Chief Executive Officer

Dear Reader:

You, personally, can make a critical investment to remove limitations on your company's success. Walk, don't run, through this white paper on the use of EDI as a vital catalyst in the strategy to ensure your company's success.

You will see clear, logical connections between the use of EDI and your company's major business objectives such as leadtime and inventory reductions, new found ability to compete, and significant overhead cost reductions. Extensive research was done to compile the information and to arrive at conclusions about the application, benefits, and expansion of EDI in the U.S. business community. I urge you to capitalize on that research and compare and contrast it to your organization's position.

The number of companies in the U.S. now using EDI has almost doubled in the space of only two years. However, over 50 percent of the firms have done so reactively, attempting to minimize expenses which, even at low levels are not totally offset by resultant benefits because of the mindset in which it was done.

One of the key determinants in whether a company approaches EDI proactively or reactively is the position of a corporation's MIS management. Of course you know the opposite of the reactive mode is a proactive mode. That proactive mode also gives you broader, more positive results.

MIS staffs understandably advocate using standard business PROCESSES since that means less complex and more streamlined business SYSTEMS. I would suggest MIS staffers pay close attention to the information in this piece and give serious thought as to how you can proactively lead efforts in your company to get an EDI strategy and program started, or expanded across ALL functional levels of your organization.

The Electronic Data Interchange Association is pleased to be a part of this excellent white paper. Our number one priority is taking your company's EDI success seriously; we do so via a full range of educational resources available for companies which recognize the benefits of and are committed to seamless links between systems applications and those of their customers and suppliers.

I am sure you will have questions after studying this white paper. Please don't hesitate to call us for assistance. Our information network of EDI users who have successfully implemented EDI as a business strategy is second to none in the U. S.

On behalf of EDIA and our members, I would like to thank IDC for their effort in preparing this white paper and COMPUTERWORLD for the opportunity to expand the level of EDI awareness in such a prestigious publication.

The Electronic Data Interchange Association
SUITE 550 • 225 REINEKER LANE • ALEXANDRIA, VIRGINIA 22314
(703) 838-8042 • FAX (703) 838-8148

Making EDI Work For You. We're Sterling Software.

RESPONSIVE EDI PROFESSIONALS
Dedicated. Conscientious. Reliable. Experts who know your market and how to optimize your EDI return on investment.

SERVING BUSINESS WORLDWIDE
Our client base includes many Fortune 500 corporations. Plus a growing number of progressive small and medium sized companies.

AND THEIR TRADING PARTNERS
Manufacturing. Retail. Grocery. Wholesale. Healthcare. Trade and Transport. Distribution. Finance. Government.

WE'RE STERLING SOFTWARE
A pioneer and global leader in EDI software products and EDI network services. Call us.

1-800-879-3341

STERLING SOFTWARE
ORDERNET Services Division

EDI Management Software ■ EDI Network Services ■ EDI Advanced Services ■ EDI Education and Training

© 1992 Sterling Software, Inc

NEW PRODUCTS

Systems

Presenta Technologies Corp. has released PC-Video VGA Model VN-01.

PC-Video VGA is an expansion card designed for IBM-compatible personal computers. The product enables a standard IBM-compatible PC to utilize any NTSC-standard device for display or recording, the company reported.

The product is a multimedia tool that supports simultaneous output via Super VGA, Super VHS, RBG analog and NTSC/PAL. Features include a proprietary firmware-based flicker reduction algorithm, overscan and underscan correction and flicker-free and real-time scan conversion.

PC-Video VGA costs $599.

Presenta Technologies
Unit F
12806 Schabarum Ave.
Irwindale, Calif. 91706
(818) 960-0420

Software application packages

MicroCal Software, Inc. has introduced Version 2.5 of its Origin Technical Graphics and Data Analysis software, adding three-dimensional and contour support.

Version 2.5 has 3-D graphs that include surface, scatter and ribbon charts. According to the company, a contour or surface chart can plot a grid of up to 256 by 255 points in size; users can plot random XYZ points as a surface with gridding specifications.

Built-in buttons on the chart permit the 3-D charts to rotate on the screen. The product has a "skip points" option that can increase the speed of the drawing so that the chart is continuously rotating in real time.

The 3-D contour features are available in two modules selling for $95 and $50.

MicroCal Software
22 Industrial Drive East
Northampton, Mass. 01060
(413) 586-2013

NovaStor Corp. has released Version 2.0 of NovaBack.

The product is a tape backup and restore software solution that offers support for Version 2.0 of IBM's OS/2, earlier versions of OS/2, OS/2's high-performance file system and DOS/Microsoft Corp. Windows files, the company reported.

Scheduled unattended backup, complete macro language for customized backup and a verify option are some of NovaBack's features. The product can support more than 100 Small Computer Systems Interface (SCSI) peripherals and more than 20 SCSI host adapters.

NovaBack Version 2.0 costs $295.

NovaStor
Suite 109
30961 Agoura Road
Westlake Village, Calif. 91361
(818) 707-9900

Avalan Technology, Inc. has announced Version 2.0 of Remotely Possible/Dial.

According to the company, Remotely Possible/Dial is a Microsoft Corp. Windows-based remote control and file-transfer package. Users can remotely control a Windows-based personal computer with keyboard and mouse operation.

Using a file-transfer utility that uses standard dial-up modems, Remotely Possible/Dial can convert files among PCs. The product can support high-resolution Super VGA and Windows accelerator display adapters. Support is provided for more than 75 modems.

Remotely Possible/Dial costs $199.

Avalan Technology
116 Hopping Brook Park
Holliston, Mass. 01746
(508) 429-6482

Peripherals

Tektronix Inc. has introduced Phaser IISD, a dye sublimation color printer.

Phaser IISD implements Adobe Systems, Inc. PostScript Level 2 software and TekColor Photofine technology. Because Phaser IISD offers continuous tone images, it is suitable for applications that require photorealistic output.

Apple Computer, Inc.'s AppleTalk serial and parallel ports are included, and Unix Transmission Control Protocol/Internet Protocol connectivity is available with the company's 4511A modem-size network interface.

Phaser IISD costs $9,995.

Tektronix
26600 Southwest Pkwy.
Wilsonville, Ore. 97070
(503) 685-3150

GoldStar Technology, Inc. has started shipping noninterlaced, flicker-free 14-, 15- and 17-in. personal computer monitors.

The monitors feature Enhanced Video Graphics Array and offer a high resolution of 1,024 by 768 pixels. According to the company, the products were designed for Microsoft Corp. Windows users who want to upgrade their computer systems with high-resolution monitors and desire a less expensive noninterlaced solution.

A Model 1465 14-in. monitor costs $699. A Model 1510 Flat Square Tube monitor costs $799; Model 1710 costs $1,299.

GoldStar Technology
3003 North First St.
San Jose, Calif. 95134
(408) 432-1331

Free Seminar on CD-ROM and Multimedia Publishing

Call 1-800-229-2222 to attend a remarkable half-day seminar that gives you a closer look at real world applications, benefits, costs and shows you how to evaluate and get started in this exciting technology.

Now you can get an inside look at the latest in CD-ROM and multimedia publishing.

The seminar is sponsored by Dataware Technologies, the world leader in CD-ROM software and services, and Emerging Technology Applications, the CD-ROM publishing unit of IDG, the world leader in providing information on information technology.

Together, they'll show you how your company can save money, make money, and give you a complete understanding of the benefits of CD-ROM and multimedia publishing.

Look at real world applications
You'll see exactly how leading companies are using these technologies today. And gain a better understanding of how your company can profit from them.

You'll learn how to get started; the title development process; how to choose software and hardware, and benefit from the experience of other companies who are already using CD-ROM and multimedia as a competitive advantage.

Look at new technologies
You'll discover new ways to work with CD-ROM. Like cross-platform publishing which allows you to distribute one disc that runs on DOS, Windows, Macintosh and UNIX; CD-Recordable which enables you to create a CD-ROM disc at your desk, portable multimedia players, and more.

Look at interactive demonstrations
You'll see a detailed demo of the new EnterpriseComputing Database which features full text and graphics from Computerworld, Network World, and InfoWorld, the industry's leading information technology publications, as well as demonstrations of other popular applications.

Look at all you get
You'll take home a free copy of the EnterpriseComputing Database demonstration disc.

And *The Guide to Optical Publishing*, a 39-page industry report which shows you how CD-ROM can benefit your company, how to estimate costs, application development, hardware selection and much more.

Look at your schedule
The seminars are absolutely free. Just check the seminar you wish to attend, and then call Dataware Technologies at 1-800-229-2222. Or fax it to 1-617-621-0307.

FREE! The Enterprise Computing Database

Now get a chance to sample the power of CD-ROM with unlimited access to the most recent six months of information.

The EnterpriseComputing Database is a comprehensive source of news, product reviews, industry summaries and more, with fully indexed text of over 35,000 articles from Computerworld, Network World and InfoWorld plus over 2500 research summaries from leading IDG research companies.

Six months of information is yours free when you attend any of the CD-ROM and Multimedia seminars.

Seminar Reservation Form

	Location	Date
☐	Boston	October 6
☐	New York	October 7
☐	Philadelphia	October 8
☐	Toronto	October 13
☐	Washington D.C.	October 14
☐	Orlando	October 15
☐	Chicago	October 20
☐	Dallas	October 21
☐	Minneapolis	October 21
☐	Houston	October 22
☐	Denver	October 27
☐	San Francisco	October 27
☐	San Jose	October 28
☐	Los Angeles	October 29

☐ Yes, I'd like a closer look. Please reserve a place for me at the seminar I have checked.
☐ No, I cannot attend the seminar, but I am interested. Please have a representative call me.

Name _____ Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Phone _____ Fax _____

FAX this Seminar Reservation Form to 1-617-621-0307 CW

INFOWORLD COMPUTERWORLD

ETA Emerging Technology Applications An IDG Company

DATAWARE TECHNOLOGIES

All brands and product names, trademark or registered trademarks are the properties of their respective companies.

THE USEFULNESS OF APPLICATION DEVELOPMENT SOFTWARE IS BEYOND QUESTION.

Companies throw out lots of claims about the value of their application development software. But how valuable are application development tools that can't do the whole job? Or that deliver applications that people can't easily use? At Cognos®, we've combined the industrial strength of PowerHouse®4GL with the easy-to-use client/server technology of PowerHouse Windows.™ The result is a combination of power and ease of use traditional development solutions can't begin to match.

COGNOS

OPEN TOOLS FOR A CHANGING WORLD.

1-800-4-COGNOS or **617-229-6600 ext. 81.** (In Canada, **1-800-361-3163.**)

© 1992, Cognos, Incorporated. Cognos and PowerHouse are registered trademarks and PowerHouse Windows is a trademark of Cognos, Incorporated. Cognos supports all major commercial UNIX and midrange platforms.

Is LAN server market ready for RISC platform?

BY MICHELE DOSTERT
CW STAFF

RISC vendors, trying to move their machines into the business world, have been trying to sell local-area network managers on the idea that reduced instruction set computing (RISC)-based machines are the logical LAN server of choice; but industry watchers don't see any compelling reason for users to abandon Intel Corp. servers just yet.

No one denies that RISC machines have gotten very powerful and very cheap in the last two years. Steve Widen, senior analyst at WorkGroup Technologies, Inc., a research firm in Hampton, N.H., said, "On average, I think we've seen 50% to 100% improvements in price/performance each year for the last few years, driven by tooth-and-nail competition between such vendors as Sun Microsystems, IBM, Hewlett-Packard and DEC."

No one denies, either, that RISC vendors have been aggressive in porting LAN operating systems to their platforms. However, most of these ports will not be available until 1993.

Novell, Inc.'s NetWare for Unix is currently available on Sun Microsystems, Inc.'s Scalable Processor Architecture/Solaris platform and will be available on IBM's RISC System/6000 in early 1993.

Hewlett-Packard Co., meanwhile, is adapting NetWare to run natively on its Precision Architecture-RISC platform. This will be the first native NetWare implementation on a non-Intel chip; it is scheduled for release sometime in 1993.

Microsoft Corp. LAN Manager, as interpreted in the NCR Corp. LAN Manager for Unix product, is being ported to a wide array of RISC platforms.

Continued on page 60

In the works

Four key Unix server vendors have projects aimed at improving their links to PC networks

■ HP's PA-RISC chip

Developing the first native NetWare for platforms other than Intel. Scheduled for release in early 1993.

■ IBM's RS/6000

Novell is developing a port of its NetWare for Unix product that will run on the RS/6000. Scheduled for delivery in early 1993.

■ Sun's SPARC chip

Currently runs NetWare connectivity — developing port of NetWare for Unix to SPARC chip. Due in 1993.

■ DEC's Alpha

Will run Microsoft's NT operating system, which includes LAN Manager functionality. Scheduled to be out by the end of 1992.

CW Chart: Michael Siggins

Innovation follows downsizing

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — OK, so you've dumped your mainframe for a local-area network, and not only didn't the business die, it got bigger.

Now what?

The question of how to grow your system after a successful downsizing project faces Turner Corp., a $3 billion construction company with 70 offices worldwide.

Turner migrated from its IBM 4341 host in June 1991, bringing in a Banyan Systems, Inc. network.

"Our real focus now is, based on the fact that we have the [LAN] in place, we can take on business re-engineering tasks more easily," said Richard A. Schell, Turner's director of information systems.

For instance, Turner is working to integrate its proprietary computer-aided design tools with commercial systems, such as Autodesk, Inc.'s AutoCAD, so that it can combine efforts with architectural firms to compete more effectively for joint design/build projects.

Many users develop applications locally that could be used more broadly throughout Turner, and the IS department is working on improving this as well.

"Something that worked in Cleveland could be used in Washington, D.C., for a different client," Schell said. He cited a logo library developed in Florida that was broadly applicable to other presentation preparations.

Accordingly, Turner is building a Revelation Technologies, Inc. Advanced Revelation database that will give users around the world better access to all of Turner's projects.

Turner is working on a separate database that will capture and consolidate contract information so various business units can look at past projects and see cost estimates vs. real costs when making bids.

In addition, Turner wants to capture the knowledge of its "gurus" for various specialties — the company has built a huge variety of buildings. The concept would allow a Turner unit in Atlanta to gain knowledge from, say, a sports stadium guru in London without having to fly in the expert from London.

Projects of these kind led John Good, Turner's manager of information technology, to crack, "We are an information management company that just happens to build buildings."

Turner's move to a LAN brought more users in contact with technology and has the IS staff scrambling to build up its users' skill sets so they can fully exploit the technology they now have.

"We need to for-

To page 60

ON SITE

Richard A. Schell, Director of IS

Claudia Edinger

Turner Corp.
New York

- **Challenge:** Help decentralized construction company make better use of database and other application programs after downsizing from a mainframe to a LAN.
- **Strategy:** Reorganize support functions, work to more effectively communicate with users to learn their needs and help them contribute.
- **Results:** Implemented innovative user training program; developed consent for new approach to support.

$57 634 615 544

By the end of this week Computerworld readers will have spent over $57.6 Billion on Information Technology this year – representing nearly half of all IT spending to date in 1992.

COMPUTERWORLD

Innovation follows downsizing

CONTINUED FROM PAGE 59

tify the decentralized organization," Schell said. He said that because Turner is so decentralized and has such diverse users — ranging from executives at corporate headquarters to construction workers at building sites — supporting them has required it to rethink training and support for users.

For example, Turner has created a traveling road show for its users. Rather than bring them in for specific training, three separate "training kits" of five personal computers and a trainer spend two weeks in each Turner office, training employees on the hows and whys of systems.

"We've accomplished one objective: to get rid of the old iron. But we're just on the front end of exploiting our new systems," Schell said.

Varying needs

Again, the variable nature of the construction industry poses a big challenge.

"The main office has business needs, and the end users are down on construction sites, so we're constantly trying to balance our customer focus," said Bill Lodge, a project leader at Turner.

Turner already does what some observers may consider implausible — supporting a 2,800-person company with only 28 IS employees.

Carrying that support a step further has meant recasting the support structure and has translated into more travel for Richard S. Enderle, Turner's project leader in charge of information and technology training.

Enderle has been sent down to a regional office in Nashville and spends a good deal of his time in the field, handling support tasks for the various Turner offices and sites in the South. He serves as a one-man pilot program for the new Turner approach to service.

As an area manager for Turner's IS department, Enderle gets called on to coordinate technology implementation with various Turner sites. He also comes in to do troubleshooting and is currently a key part of Turner's efforts to support its Miami sites in the wake of Hurricane Andrew.

Downsizing definitely makes a difference at Turner, despite the increased demands on its IS staff.

"The only thing I'd change is the schedule — I'd accelerate it," Schell said. Turner moved gradually toward shutting off the mainframe, beginning its research in 1986.

We have an easier way to connect your notebook users to your network.

With docking stations, proprietary LAN cards, and who-knows-what-all out there, networking notebooks can get absurdly complicated. So we've devised a much more practical bit of hardware. Our Pocket LAN Adapters.™ They're compatible with virtually all notebooks, all network operating systems, and all topologies. And your users can easily come and go without any hardware hang-ups. For more info, call 1-800-874-7875 ext. 21A. Better yet, call your dealer. And try one out on a notebook user today.

Xircom

RISC vendors eye LAN gear

CONTINUED FROM PAGE 59

NCR currently offers it on its Mips Computer Systems, Inc. System 7000. Data General Corp. and Dansk Data Electronic are porting LAN Manager for Unix to their RISC systems based on the Motorola, Inc. RISC chip; it is also being used in numerous OEM deals.

Banyan Systems, Inc. said it plans to port its Vines network operating system to various RISC platforms but has not yet selected which platforms will be first.

RISC proponents cite two features of RISC that seem to make it a natural for LAN servers: a multibus design optimizes server I/O, and powerful processors running at speeds up to 100 MHz optimize server data processing. This power seems to make RISC a natural for large LANs or processing-heavy applications.

John Dubiel, manager of planning and technology at Boston Edison Co., plans to investigate NetWare for the IBM RS/6000 when it comes out.

"If you look at Novell's pricing structure, the way applications are priced for concurrent use and the cost of support, everything is forcing us to fewer, larger servers. We're looking for price/performance, so we will definitely investigate RISC as a server platform," Dubiel said.

Bob Buchanan, vice president of LANQuest, a benchmarking laboratory in San Jose, Calif., said he thinks that while most applications do not yet need the processing power of RISC, such compute-heavy programs are definitely coming.

However, advances in Intel-based superservers may have eliminated RISC's advantages. For example, several of the superserver companies have added intelligent processors to their buses to speed LAN I/O.

RECRUITING TALENT FOR LOS ANGELES?

Advertise in the October 19th Western Edition when *Computerworld's* regional Careers feature examines "IS Careers in Los Angeles."
Ad Close: October 15.

800 343-6474 ext. 201

It's curious what passes for interoperable computer systems these days.

Lately, many computer makers are claiming, "Our systems are open." But their customers are asking, "Open to what? *Your* computer environment? Or ours?"

The point is well taken. Because computers should work with systems already in place, the customer's existing investment. And with systems yet to come, the customer's future investment. It's a big assignment—*interoperability*, enabling information to move freely across different computer environments.

Permit us to suggest a simple test. Ask your computer providers if their commitment to interoperability extends to a few of their offerings—or all of them. Ask if their commitment ends with UNIX® and PC operating systems—or anchors their systems architecture and corporate strategy. Total interoperability does not yet exist. But a total commitment to interoperability puts Unisys at the head of the industry—and gives our customers a head up on the competition.

Perhaps you hadn't realized that Unisys is a pioneer at delivering information solutions over open information networks. And among the first to appreciate that open systems are only one stop on the drive to interoperability.

"No supplier is doing more to respond to its customers' requirements for interoperability across an entire product line than Unisys," reports the Aberdeen Group. We've brought the benefits of interoperability to customers such as The Limited, the State of Ohio, Banque Bruxelles Lambert, and more. It's all part of our focus on the customer. And a prime reason 60,000 Unisys customers in 100 countries rely on us for solutions to fit their needs. Not merely our own.

UNISYS

We make it happen.

Call us at 1-800-448-1424, ext. 171. Whatever shape your systems are in, we can shape a solution equal to the challenge.

©1992 Unisys Corporation

UNIX is a registered trademark of UNIX System Laboratories, Inc.

Domain users OK latest HP support plan

BY MARYFRAN JOHNSON
CW STAFF

More ardently than ever before, Hewlett-Packard Co. is courting its Apollo/Domain users, this time with a better coordinated support program that creates a kind of one-stop shopping for their needs.

HP is determined to hang onto the business of those 100,000-plus users still running the 4-year-old, proprietary Domain operating system on workstations from the former Apollo Computer, Inc., which HP acquired in 1989.

After three years of fits, starts and complaints from disgruntled users, the vendor has finally settled on a plan that pulls the scattered pieces of Domain support together under one roof.

"HP has been very aggressive in seeking information from people with large [Apollo] accounts and in working with our user group," said Doug Eltoft, president of the 4,500-member IWorks HP/Apollo workstation user group.

"They really should have done this earlier," added Eltoft, who directs the Iowa Computer Aided Engineering Network at the University of Iowa, which has more than 300 HP and Apollo workstations. "Things have never been this well-coordinated before."

HP has promised to sustain Domain's life until the year 2000, although the last major release of Domain 10.4 will receive only incremental improvements, bug fixes and updated peripheral connections.

Gift of life

"Our charter is to provide extended life support for Domain so customers can choose when they migrate," said Jim Stroh, product line manager at HP's Software Technology Division in Fort Collins, Colo. "We want users to know we have a team of people keeping Domain active and viable."

A separate division of HP focuses on upgrading and migrating Apollo workstation users to HP 9000 Series 700 workstations.

Stroh's group has a distinctly different charter: to provide "mature software support" for Domain, MPE 5 and RTE, an older real-time operating system for HP 1000 systems.

The most visible change for Domain users will be more timely and accurate information about bug fixes, Stroh said. "We don't want anyone to see a major shift," he said. "We don't want disruption in the user base."

In recent customer surveys, Stroh said, HP discovered that once users vented their frustration at Domain's eventual disappearance, they acknowledged being "reasonably satisfied" with service levels.

"We found that what customers want from us is better communication. Many were not aware of when we issued patches [to the operating system]," he explained.

At a recent HP/Apollo user conference in New Orleans, Eltoft said a survey of 280 workstation users showed that some 30% are only running the HP/UX Unix operating system, 20% only Domain, and the remaining 50% are running both.

"Most people [at the conference] were very happy to hear what HP is doing, such as focusing on specific bug fixes for Domain," Eltoft said.

"HP still wants everybody to migrate, of course, but I heard a lot of users saying they're very pleased that HP is doing this," Eltoft noted.

Staying with its own

Along with the problems of tending to a dying operating system, many Apollo/Domain users have been annoyed with HP for deciding not to adopt the Open Software Foundation's (OSF) OSF/1 kernel and keeping its HP/UX kernel instead.

With its more advanced functionality and multithreading capabilities, the OSF/1 kernel was considered a better bridge to the future by Apollo users.

"There have been some burt feelings that HP lied to them or at least misrepresented things," Eltoft said. "But if you sit down and talk to HP [executives], the decisions they've made do make sense."

He was referring to HP's plan to make the existing HP/UX kernel compliant with the OSF's Application Environment Specification in the upcoming release of HP/UX 9.0.

Two heads are . . .

The HP/Apollo workstation user group, which recently changed its name from InterWorks to IWorks, is now offering a $75 compact disc/read only memory (CD-ROM) that includes more than 500 public domain applications, games, utilities and tools for both the Domain and HP/UX operating systems.

Created through a joint project by HP and IWorks, the CD-ROM includes 360 Domain packages and 150 HP/UX packages for Series 700 workstations. It is intended as the first in a series of similar releases covering "the whole gambit of public domain software," said Doug Eltoft, president of IWorks.

Copies can be ordered by contacting Carol Relph at HP's Workstation Business Unit in Chelmsford, Mass., at (508) 436-5046.

STRATEGIC

Can you sustain record growth without

EDS helped Jackson National Life say yes.

Since 1985, Jackson National Life has **grown 750 percent** while maintaining one of the lowest cost-to-premium ratios in its industry. They did it thanks in part to information technology from EDS that significantly improved customer service response time and boosted productivity.

EDS developed systems that streamlined administration and workflow, making the company more responsive to customers. And Jackson's VP of technology, Curtis Shankel, says, "New systems now in development will **improve productivity 40 percent more.** Those systems will allow customers to deal with one employee

EDS is a registered trademark of Electronic Data Systems Corporation. © 1992 EDS

NetWare tools, equipment promise better automation in LAN backup

BY MICHELE DOSTERT
CW STAFF

Backing up and restoring data has traditionally been the Achilles' heel of local-area networks in corporate computing. Recently, vendors have begun introducing hardware and software products to facilitate — and automate — LAN backup.

"Frankly, a lot of people's network backup is just awful, and they don't find that out until they need to restore some data," said Cheryl Currid, a LAN analyst who runs Currid and Co. in Houston. "LAN backup should be automated, it should be centralized, and it should be idiot-proof."

Aiming for idiot-proof data protection, Intel Corp. in Santa Clara, Calif., has introduced an integrated hardware/software backup server designed to provide automated, centrally managed, unattended backup of Novell, Inc. NetWare-based LANs.

Currid said she thinks the new Intel system could be just what the doctor ordered for large NetWare LANs.

Intel's new StorageExpress system is unique in providing a complete, hardware/software, plug-and-play backup solution. It can back up not only multiple servers on a LAN, but also data stored on DOS, Microsoft Corp.'s Windows and OS/2-based LAN clients. Built-in scalability lets a LAN administrator continue to manage one single backup process from one central console, no matter how many StorageExpress systems are employed.

The StorageExpress system hardware consists of an intelligent controller with an Intel i486 CPU, an integrated 32-bit Ethernet interface and a Small Computer Systems Interface-2 controller for fast data throughput. The system can be ordered with either 200M- or 500M-byte hard drives and either 2.2G- or 5G-byte tape drives; an additional 5G-byte tape drive can also be added. Peripheral ports are preconfigured to support label printers and an uninterruptible power supply.

The control unit is preconfigured with NetWare RunTime from Novell and has NetWare Loadable Modules and backup software, co-developed by Intel and Cheyenne Software, Inc., preinstalled, configured and tested.

> "LAN BACKUP SHOULD be automated, it should be centralized, and it should be idiot-proof."
>
> CHERYL CURRID
> CURRID AND CO.

On the software side, StorageExpress's user interface is a Windows application that allows backup-and-restore operations to be custom-tailored. It automatically prompts for tape rotation and routine maintenance and includes system-level diagnostics and on-line help.

For users who already have the hardware but are looking for automated backup software to protect their data, FortuNet, Inc. in Salt Lake City and Gigatrend, Inc. in Carlsbad, Calif., have both announced products.

FortuNet's new Nsure V1.2 suite of backup software products includes NetWare and DOS server backup managers, as well as client backup software for NetWare, DOS, OS/2 and Unix clients.

Nsure supports a multiple-protocol environment that supports IPX, NetBIOS and Transmission Control Protocol/Internet Protocol LAN transport protocols. This allows Nsure to provide backup for popular LAN operating systems, such as NetWare and Microsoft's LAN Manager, as well as for DOS, OS/2 and Unix. "We operate in parallel with LAN [operating systems] but we're not dependent on them; all we need to back up is compatible transport protocols between any two points," FortuNet President Richard Watson said.

Gigatrend, a leading manufacturer of 4mm digital audio tape storage systems, is now shipping MasterSafe Enterprise, tape backup software that backs up and restores multiple LANs and wide-area networks to a tape station on the network.

Support options

MasterSafe Enterprise was designed for enterprisewide backup, supporting ArcNet, Ethernet, Token Ring and fiber-optic topologies, as well as wide-area technologies such as T1. It works on any LAN running NetWare. 2.x, 3.x or NetWare for Unix.

MasterSafe Enterprise permits multiple network fileservers and workstations to be backed up simultaneously. This parallel processing of backup tasks was designed to improve backup performance.

Wayne Roberts, LAN administrator at St. Agnes Medical Center in Fresno, Calif., is impressed with the Gigatrend software. "Using MasterSafe Enterprise, we are backing up two servers to a tape station at speeds up to 41M byte/min.," he said. "We plan to do global backups on a nightly basis and incremental backups every two hours using this new system-based backup software."

QUESTION:

compromising the service that helped create it?

for all their needs. So we can **offer better service faster.**"

EDS also provides transaction processing, enabling Jackson to avoid large, up-front investments in additional computing capacity.

Net: Jackson's operating costs have decreased. Yet among U.S.-based life insurance companies, Jackson ranks in **the top one percent in winning new business**. "EDS has been—and will continue to be—an integral part of Jackson National Life's success," said David A. Pasant, the company's president and CEO.

Changes in technology can help you grow rapidly while controlling your costs. EDS is the world leader in applying information technology. To find out how we could help you, write Barry Sullivan, EDS, 7171 Forest Lane, M45, Dallas, TX 75230. Or call (214) 490-2000, extension 245.

EDS

TAKE ADVANTAGE OF CHANGE™

Record company gets down to downsizing on low budget

BY CAROL HILDEBRAND
CW STAFF

The Rolling Stones and the Grateful Dead aside, making a living in the music business is difficult at best for most artists. But for Rounder Records, a shoestring budget did not mean that information technology was left dangling.

Bob Mitchell, manager of the studio's MIS department, has managed to assemble a system that fulfills his aim of decentralizing the computer system while still recycling as much incumbent equipment as possible, thus saving the company precious dollars.

Based in Cambridge, Mass., Rounder was formed in 1970 by three Boston-area college students who sold their wares out of an old Volkswagen bus at folk festivals. Since then, the company has grown to an $18 million concern with a staff of more than 70. However, with its main labels specializing in niche musical genres such as reggae, Cajun, zydeco and the blues, mainstream acceptance is not likely, Mitchell said.

Thus, when the company outgrew its old system, Mitchell decided he would see how much he could expand while keeping costs to a minimum.

"The whole thing was driven by cost and coincidence," he said.

Rounder has been running on an Altos Computer Systems 1000 machine for several years and wanted to stay in that niche for cost reasons. Mitchell said it came to that decision after evaluating whether to continue in its current direction or start from scratch.

Personal computer networks were out of target range for the budget, as was getting all new software.

Mitchell ended up with another Altos — a 486 box with 36M bytes of random-access memory and 1.4G bytes of storage — running The Santa Cruz Operation's SCO Unix. Attached to the server are cluster unit controllers supporting up to eight dumb terminals each. He has about 70 devices attached, with about 55 users running at peak times. The server runs customized accounting software from RealWorld Corp. in Concord, N.H., which the company had previously used, and WordPerfect Corp.'a word processing package.

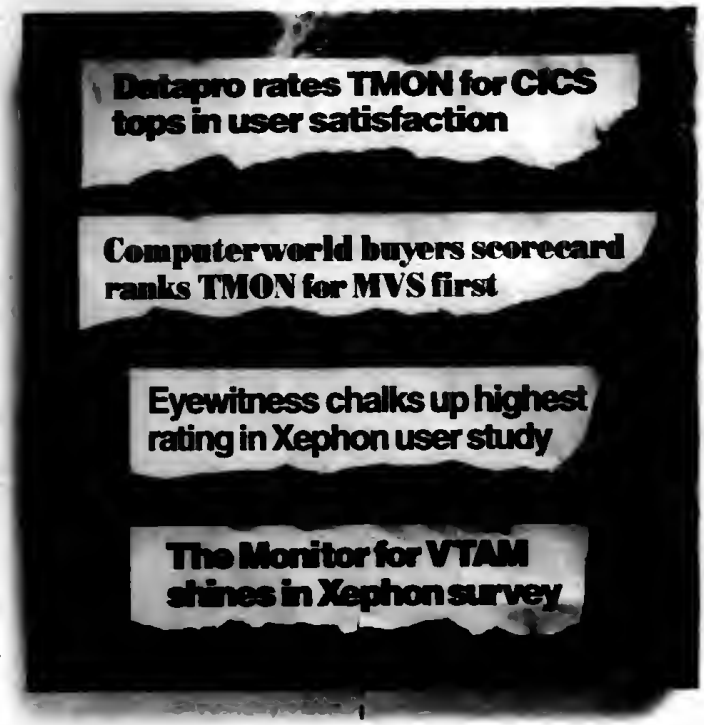
Although Mitchell said he knows his shop is not cutting-edge, what is important is that he was able to get technology out across the company and help streamline operations.

For example, orders are placed on-line by a salesman, and the credit is automatically verified on-line by the software, thus saving the accounting department about an hour a day by eliminating manual credit checks. In the warehouse, orders are pulled from the computer, which then compiles a complete shipping manifest for United Parcel Service, Inc. to check.

Receiving, which the company automated last month, has cut down on the number of human errors caused by the old handwritten forms, he said, particularly since the orders now can he compared with the on-line versions entered by the buyer.

Mitchell said keeping things simple is essential, considering the nature of most of his clients. Many of the people who work for Rounder are musicians who, he said, tend to distrust machines. "Which is cool," he said, "because it makes them better consumers" and gives him a strong mandate to simplify.

He said the initial distrust has turned into excitement over what the system can do, and users are doing their own exploring.



TNET.™

A SYSTEMS MANAGEMENT BREAKTHROUGH THAT WASN'T BORN YESTERDAY.

There's nothing like the thrill of discovering new technology that makes your job easier. Better yet – a quantum leap that's well-grounded in time-tested, top-rated products. Take TNET™. When it comes to improving IBM systems performance, only TNET – the architecture on which our networked family of performance tools is based – takes you straight from problem to solution.

Best of all, TNET is based on industry-leading performance monitors and proven problem management products. World-class tools that users and independent researchers alike rate number one in value, service, and ease-of-use.

So if you want tomorrow's solution that already has a reputation for excellent results, call us. We'll be happy to share with you some user success stories and industry studies from *Computerworld*, *Xephon*, and *Datapro*.

THE LANDMARK ADVANTAGE

THE MONITOR FOR CICS® • THE MONITOR FOR CICS® (VSE) • EYEWITNESS® • THE MONITOR FOR MVS®
THE MONITOR FOR DB2 • THE MONITOR FOR VTAM • NAVIGRAPH™

Landmark Systems Corporation® 8000 Towers Crescent Drive Vienna, VA 22182 1-800-227-8911 LANDMARK

Royal Bank taps Notes for help

BY ROSEMARY HAMILTON
CW STAFF

The Royal Bank of Canada in Toronto had not been in pursuit of a groupware product. But when its New York office asked for help in sharing information among account managers, the bank decided to take a look at Lotus Development Corp.'s Notes.

"They pushed it, so we accelerated our look [at Notes]," said George Oliver, manager of information delivery technology. Now "we are seeding it throughout the organization."

Oliver said initial reaction to Notes is positive, but the bank is not yet certain what kinds of productivity boosts it will deliver. "How it shows up on the bottom line still has to he proven."

But he has seen some initial results within the technology group, which is using Notes to share data among project teams. Before Notes, the teams relied on "paper and people's memories and lots of meetings," Oliver said. "We are hoping to cut down on all of those things."

When Royal Bank evaluated Notes, it determined "that there isn't another product like it. . . . It has significantly rich function."

NEW PRODUCTS

Workgroup software applications

Business Objects, Inc. has introduced BusinessObjects, a data access solution for relational databases.

According to the company, the product's Microsoft Corp. Windows- and DOS-based front ends give users access to relational databases from desktop personal computers and workstations. Several new technologies have been added, including data representation and a query technique.

Prices start at $9,360.

Business Objects
Suite 240
2500 Sand Hill Road
Menlo Park, Calif. 94025
(415) 854-1500

Database Publishing Software, Inc. has released SmartLeaf Batch Processor.

The product is a queue-based version of the company's SmartLeaf product line. Users can design Interleaf documents from information stored in databases, the company reported. SmartLeaf Batch Processor is suitable for generating financial statements, invoices and reports.

Prices begin at $7,000.

Database Publishing Software
Suite 6800
800 Cummings Park
Woburn, Mass. 01801
(617) 938-0018

Workstations

Commodore Business Machines, Inc. has introduced the Amiga 3000T-040/200, a multimedia workstation.

Powered by a Motorola, Inc. 68040 processor with an integrated math coprocessor, the Amiga 3000T-040/200 includes AmigaDOS 2.0 and has a 200M-byte hard disk drive. A 32-bit bus architecture and 5M bytes (expandable to 18M bytes) of random-access memory are provided. Commodore's service program, CommodoreExpress Gold Service Options, is included with the product.

The price is $5,998.

Commodore Business Machines
1200 Wilson Drive
West Chester, Pa. 19380
(215) 431-9100

Unix

Tektronix, Inc. has introduced Phaser Print, a printing solution.

According to the company, the product enables Unix workstation users to print Adobe Systems, Inc's PostScript files and raster screen dumps on any of Tektronix's color printers with PostScript Level 2 software.

Color matching, image positioning and scaling are some of the control printer features included in Phaser Print. The product is available on 8- and 24-bit Sun Microsystems, Inc. and Silicon Graphics, Inc. workstations that run the X Window System, Open View or Sun View.

Phaser Print costs $995.

Tektronix
26600 Southwest Pkwy.
Wilsonville, Ore. 97070
(503) 685-3150

Structured Software Solutions, Inc. has released FacetTerm for Alpha Windows.

The product was designed to offer window management support for Alpha Window terminals, a generation of character terminals that use a window-style user interface, the company reported. Multiple windows running various Unix applications can be opened, moved, resized, stacked and closed.

FacetTerm costs $495.

Structured Software Solutions
Suite 205
4031 W. Plano Pkwy.
Plano, Texas 75093
(214) 985-9901

Maxa Corp. has introduced Reveal, a Unix diagnostic and system monitor for the RISC System/6000.

Reveal can be used as a foreground utility, giving users three screens of information that indicate system load levels with numeric and light bar scales, the company reported.

General information regarding the system total CPU use, disk activity and total memory use is shown on the main screen. The process screen reveals which users or processors are using the most system resources.

Reveal for the RS/6000 costs $999.

Maxa
Suite 100
116 Maryland Ave.
Glendale, Calif. 91206
(818) 543-1300

Pacific Genesys Development, Inc. has released ReForm, a Unix software tool.

According to the company, ReForm reduces or eliminates the use of preprinted business forms by enabling Unix software applications to generate forms with data output to a plain paper laser printer or a fax system.

ReForm can support most accounting and database software. The product prints to any Adobe Systems, Inc. PostScript- or Hewlett-Packard Co.-compatible laser printers.

Prices range from $595 to $1,295.

Pacific Genesys Development
1616 Evelyn St.
N. Vancouver, B.C.
Canada V7K 1T8
(604) 988-1388

Our Idea Of A Perfect Ten.

At Lexmark, we take a close look at every aspect of character generation to make sure your IBM equipment delivers maximum performance.

A zero-defect zero. Even at this extreme point size there's no edge blurring or noticeable stairstepping to bring you down.

10

This is the one. Dark and bold; even and uniform at every turn.

IBM printer toners by Lexmark assure your characters are permanently fixed to the page. No smudges here.

There are a number of reasons to use Lexmark original replacement toner in your IBM® printer. This number ten is just one of them.

Lexmark is constantly testing and improving our toners to make sure they consistently produce the finest quality characters and the highest possible yield.

For the pinnacle in laser printing, insist on original IBM toners by Lexmark. Our toners will never do a number on you.

To order, to locate the dealer nearest you, or to receive your free catalog, call 1-800-438-2468, ext. 40. (In Canada, call 1-800-663-7662.)

Lexmark International, a former subsidiary of IBM, is an independent, worldwide company that develops, manufactures, and markets IBM personal printers, IBM typewriters, related supplies and keyboards.

IBM Supplies by
LEXMARK™
Make Your Mark

IBM is a registered trademark of International Business Machines Corporation in the United States and/or other countries and is used under license. Lexmark is a trademark of Lexmark International, Inc. © 1992 Lexmark International, Inc.

Always a Next Step.

With Global Communications From BT

Going Further

With every forward step into the world marketplace, you expect greater success, better solutions. Not a different set of problems.

So you look for a global communications partner who has been there, who has managed cultural, compliance, currency, and language issues. One company who makes it all happen, while you take care of the business at hand.

BT™ has a global presence that our competition can't match. The TYMNET® Global Network (TGN), with the largest market share among U.S. value-added networks, supports Global Network Services (GNS™) that reach 90% of the world's business centers in more than 100 countries. Half of Europe's multinationals use our services.

GNS links your international divisions. Then we monitor and support those links worldwide, bill in one currency, and offer a portfolio of applications—a single-vendor solution that makes your life easier.

Staying Closer

When BT is there for your global communications program, you have a consulting partner who'll help plan your network... customize and simplify... make sure everything plugs in where it should at locations worldwide. If you want, we'll manage it end-to-end.

But we know that partnership goes beyond just making things work. It means understanding your business strategies and corporate culture... tailoring solutions to meet your challenges, matching our global technology to your local needs. Helping you go further with your business, and stay closer to your customers.

Before you take the next step, call 1-800-872-7654 (US) or 1-800-874-7654 (Canada) for more information and our Going Further Staying Closer brochure.

Global Network Services
ExpreseLANE™
Frame Relay
Videoconferencing
EDI•Net®
BT Messaging Services
Electronic Transaction Services

Come see us at TCA - Booth #1613
and
At INTEROP - Booth #2431

BT™

© British Telecommunications plc 1992 2025-205E

Diverse standards take step in unison

BY ELISABETH HORWITT
CW STAFF

A consortium of users, vendors and standards organizations has released what it claims is the definitive treatise on how today's free-for-all of conflicting and competing network management products and standards can lie down together in peaceful coexistence and interoperability.

Leading network management vendors and standards groups such as the Network Management Forum, X/Open, the Open Software Foundation (OSF), the Object Management Group and Unix International achieved "an unprecedented degree of cooperation" to bring out Omnipoint 1 on schedule, said Hewlett-Packard Co. spokesman Bob Emerson.

"We have never had a single blueprint or vision of how all those [different standards] can be pulled together in practical, real terms that can be used by vendors and customers," said Gary Francis, IBM's director of network management products.

"One advantage of Omnipoint is the avoidance of major conflicts and overlaps between different standards; you get a package of standards that hangs together," Emerson said. Major standards in Omnipoint include Simple Network Management Protocol (SNMP), the Open Systems Interconnect (OSI) Common Management Information Protocol (CMIP) and the OSF's Distributed Management Environment (DME).

NETWORK MANAGEMENT

Omnipoint's "second benefit is stability," Emerson said. A major obstacle to widespread vendor implementation of standards such as CMIP is the tendency of standards bodies to change the protocols every year or so. "So you get different vendors implementing different versions, and you quickly reach the point where no two systems interoperate," Emerson said. Omnipoint is guaranteed to remain in its current form for two years.

The drawback to this stability, however, is that certain gaps in the first Omnipoint release cannot be addressed until the next version comes out. Omnipoint has only begun to tackle the crucial question of how SNMP- and CMIP-based systems can interoperate. The consortium is now working on mapping guidelines between the two standards' object definitions, which enable different network management systems to talk the same language when they are describing a managed device or a management function.

The consortium is also working to achieve some degree of commonality between the models used by Object Management Group's Common Object Request Broker Architecture and those used by OSI.

Omnipoint 2, due out in two years, will address both of these issues, Emerson said.

Meanwhile, the big question in users' minds is whether vendors will really implement the full Omnipoint 1 plan to the point where their systems can interoperate. The danger is that vendors will be content with the level of commitment that IBM delineated in its formal statement of support for Omnipoint: the promise of "implementing one or more of the Omnipoint elements such as SNMP and CMIP protocol support" in its products. Because virtually every major network management vendor now supports either SNMP or CMIP, this is not a significant statement.

The Network Management Forum User Group recently issued scorecards for vendors to fill out, outlining a schedule for bringing out Omnipoint-conformant products [CW, June 29]. The scorecards, which are due back to the user group next week, put the vendors in a quandary, Emerson said, "We have to respond without preannouncing our 1993 and 1994 product plans," Emerson said.

Meanwhile, users may turn to DME, which is due to become an implementable standard by the end of next year. Unlike Omnipoint 1, which is "about 97 documents that users can't do anything with directly, DME is an implementation; it's code that users can get direct value from," Emerson said.

HP targets OpenView to new markets

BY ELISABETH HORWITT
CW STAFF

PALO ALTO, Calif. — OpenView is hot, and Hewlett-Packard Co. plans to make it hotter, the company said, by dividing up the DOS and Unix sides of its network management product and allocating more marketing and development personnel to both versions.

HP announced last week that its PC Software Division will assume responsibility for the HP OpenView Microsoft Corp. Windows platform, which HP sells primarily through value-added resellers as a local-area network management system, the company said.

In addition, HP has created a new Network and System Management Division to take over Unix-based OpenView.

OpenView is billed as a multivendor enterprise network and systems management platform and is sold directly by HP, company spokesmen said.

All the right moves

HP is making the "right move" by sharpening its thrust into the fast-moving, increasingly cutthroat integrated network management market, said David Passmore, a program director at Gartner Group, Inc.

OpenView is a leader in this arena right now, with an installed base of 11,000 user sites, HP said. The product family took 24.5% of the LAN management market last year, according to International Data Corp. (IDC) in Framingham, Mass.

However, OpenView is hotly contested by Sun Microsystems, Inc.'s SunNet Manager, which had 22.6% of the market last year, according to IDC.

The new HP unit will be led by Robert Hoog, former head of the company's Systems Management Division. Hoog will take over the job of Peter Hamilton, the former HP general manager of network management who recently became president and chief operating officer at Banyan Systems, Inc.

The reorganization reflects the very different markets that the two products target, HP spokesmen said.

Unix-based Openview targets users who want to manage multivendor networking equipment across the enterprise in an integrated way; the Microsoft Windows product has been used pri-

Continued on page 68

Videoconferences give life to team approach

BY JOANIE M. WEXLER
CW STAFF

WATERBURY, Vt. — Ben and Jerry's Homemade, Inc. is one company practicing the Japanese style of management that requires close teamwork among employees who might be geographically scattered. Videoconferencing is one way the ice cream maker is trying to foster tighter-than-ever interaction while continuing to distribute its corporate sites.

Ben & Jerry's is about a year into a team quality management process that is long espoused by the likes of W. E. Deming and other management strategists, who point to its success in Japan, explained Maureen Martin, Ben & Jerry's communications coordinator.

The idea is to define, for example, measurable manufacturing process parameters so firms can identify what goes awry or is wasteful in factory output. Many strategists have said that cross-departmental involvement at all job levels is integral to the success of that process.

At Ben & Jerry's, the philosophy translates into nine teams of 10 to 15 employees from various Vermont sites focusing on corporate quality in areas such as manufacturing excellence, customer feedback and service and employee orientation, Martin explained.

The company turned to videoconferencing technology in March. Ben & Jerry's has linked its two most distant sites — offices here and a manufacturing plant in Springfield, Vt. — and is considering further deployment throughout its three manufacturing plants, three of its ice cream stores, a distribution center and a smattering of nationwide sales offices.

On the manufacturing side, for example, a team member could leverage an electronic conference to demonstrate a current process for packing ice cream into containers, then demonstrate to viewers suggested ways to improve on the process.

Users need only about a five-minute training session to learn to set up an electronic meeting with the high-end PictureTel Corp. System 4000 equipment, Martin said, although many of the 500 employees in Ben & Jerry's renowned casual corporate culture are going through a mental adjustment period with the technology.

"We're still ramping up and getting used to cameras and seeing our own faces" on the monitor, Martin said. She described, for example, one videoconference member who kept forgetting she could be seen and continually whispered into a local colleague's ear.

"This isn't the be-all, end-all for communications, but it beats a speakerphone," Martin said.

Aside from these employee adjustment hurdles, she said, for a month after Boston-based systems integrator USTeleCenters installed the equipment, the two participating public telephone carriers at each end of the link could not get the videoconferencing equipment to work at full fractional T1 speeds.

Ben & Jerry's is currently using 728K bit/sec. of a dedicated T1 line between sites for video "because we have no switched data services in Vermont," Martin explained.

Continued on page 73

ON SITE

Ben & Jerry's Homemade
Waterbury, Vt.

- **Challenge:** To follow through on a new interdepartmental team management philosophy despite team members being scattered across geographically dispersed sites.
- **Technology:** PictureTel System 4000 high-end videoconferencing equipment.
- **Results:** Videoconferences allow team members to regularly brainstorm, demonstrate manufacturing techniques and otherwise interact.

HP targets OpenView to new markets

CONTINUED FROM PAGE 67

marily to manage one type of HP or third-party network device.

HP said it hopes to reposition Microsoft Windows OpenView as an integrated LAN management system. Although the Microsoft Windows product accounts for about 80% of OpenView units shipped, it has been sold primarily to OEMs, which then package it as the network management piece of their network products, according to Passmore.

"Now HP is repositioning the product as an integrated management platform in its own right," designed to manage LANs at small workgroups and individual sites, Passmore said. The product will be distributed primarily through the retail channel and will ultimately be shrink-wrapped, HP indicated.

Looks familiar

HP has noted that the Microsoft Windows versioo will "take on a lot of the capabilities now provided by big brother Unix," Passmore said.

"They intend to provide some degree of commonality in terms of the graphical user interface and eventually the application programming interfaces," so the same applications could ultimately run on both products, Passmore added.

Still in question is how HP plana to coordinate sales of the two products for users who want the Windows OpenView to manage individual LANs and sites, and feed information up to the Unix-based OpenView that oversees the enterprise. Hoog will be coordinating marketing across the two organizations.

In addition, users can call a toll-free customer service number to learn more about both products, HP said.

Soon to be released

Although HP introduced the Microsoft Windows version of OpenView first, the Unix product is more standards-oriented and feature-rich, as befits a multivendor, enterprise network management system.

New versions of the products, which HP announced last week, will move the Windows version closer to the Unix version's functionality and will move both versions closer to standards-compliant "openness," HP said.

The announcements included the following:

Openview for Windows introductions:

- Version 6.0 has started shipping with new features such as dynamic map updates and an enhanced menu system.
- Version 7.0, due out in the first quarter of 1993, will include auto discovery, which allows the system to determine automatically what devices are where on the network and to use the collected information to create a topological map. Another new feature is a Simple Network Management Protocol (SNMP) Management Information "Browser" and application builder, a current OpenView-Unix feature.

The browser and builder are said to enable an SNMP-based network management system such as OpenView to automatically figure out how to take advantage of special management features that vendors frequently add to the SNMP agents that manage their devices.

OpenView for Unix introductions:

- Release 3.1, now shipping, supports a distributed management infrastructure, in which multiple network management nodes can send alerts and data to one another or to a central system. Also supported is the Consolidated Management application programming interface, an Open Software Foundation Distributed Management Environment protocol that is said to enable applications to manage devices via either SNMP or Common Management Information Protocol.

ELISABETH HORWITT

PRESENTING THE AUTOMATIC SAFETY NET FOR ALL YOUR CORPORATE PC DATA.

Now Available For OS/2

Announcing unparalleled protection for your PC data.

It's called DMS/IB (Intelligent Backup). And it safeguards your corporate data better than any other PC backup product you can buy.

DMS/IB guards against corruption with its powerful data verification function. Multiple redundant indexes and a separate history file guarantee the speed and integrity of your restores.

Its support for totally automatic, unattended backups ensures data gets backed up regularly. DMS/IB will even remind users when it's time to backup their PC data.

All of which means DMS/IB is the best corporate data protection you can buy. And its advanced backup options and multiple compression levels reduce backups to minutes per day.

In short, DMS/IB is the safety net you need to protect your corporate PC data. And it's one you can get simply by calling Sterling Software at (916) 635-5535.

STERLING SOFTWARE

THE FUTURE IS STERLING.

Sterling Software, Systems Software Marketing Division 11050 White Rock Road #100 Rancho Cordova CA 95670 (916) 635-5535
Sterling Software is a registered trademark of Sterling Software, Inc. All other product names are trademarks of their respective companies

COMPUTERWORLD

CAREERS ON-LINE

508 879-4700

with your computer/modem

COMPUTERWORLD.

The Nonstop Computer Newspaper That Works for You.

8:12 a.m., Thursday. News Editor Alan Alper and Assistant News Editor Patricia Keefe meet at the Framingham home office to review the hottest news that's come in during the week from all over the world.

1:58 p.m. Stories continue to pour in. Alper meets with top editors and production people to map out the 12 late-breaking news pages. Art Director Nancy Kowal presents ideas for visuals that will bring the news stories to life.

6:09 p.m. Tokyo Correspondent Lori Valigra receives a hot tip on a new technical advance in active matrix displays for PC's. She calls her sources in Japan to check out the rumor.

10:37 p.m. Alper, Keefe, and staff finish editing the final stories, clean up the pizza boxes, soda cans and shut down for the night.

8:02 a.m., Friday. The *Computerworld* staff filters into headquarters for the final push. Finished layouts must be at the printer by the end of day to make the deadline.

10:32 a.m. Maryfran Johnson, Senior Editor, transmits a story from the IBM Scientific Computing Conference in Palm Springs. IBM has announced the details of a major advance in RISC-based processing.

12:48 p.m. Midwest Bureau Chief Ellis Booker puts the finishing touches on a story about the first user of NCR's new parallel high-end processing system.

5:37 p.m. Electronic transmission of the latest news in IS is complete. The current issue of *Computerworld* is on its way to you.

The world of information systems never stops. And neither does Computerworld.

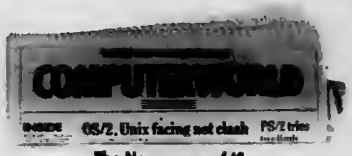
In fact, 58 reporters, editors, writers, and designers work around the clock and around the world to bring you the most up-to-date news in IS.

What's more from the time your issue rolls off the presses at midnight on Friday, it takes some 25 airplanes, 5 trains, 7 tractor trailer trucks, and 37 major city postal centers to deliver *Computerworld* to your desk by Monday morning.

Order today and you'll receive 51 information-packed issues, plus our special bonus publication, *The Premier 100*, an annual profile of the leading companies using information systems technology.

Call us toll-free at **1-800-343-6474.** Please refer to code DCIRC-2 when ordering. Or use the postage-paid subscription card bound into this issue. And get your own copy of *Computerworld.*

Because with the right information, your career can really take off.



The Newspaper of IS

Only one electron
gets the stamp of app

Nearly 2 million people around the world have given cc:Mail™ a vigorous thumbs up. And for good reason.

cc:Mail allows you to send messages transparently and maintains a consistent set of features across all these major platforms. That's because it was built from the ground up to support network environments made up of different platforms and LANS—a design consideration that seems to elude most e-mail systems. Further, it's the only system that gives you a wide range of options for enterprise-wide connectivity. cc:Mail can even exchange mail messages with most mini and mainframe mail systems such as IBM® PROFS® and offers gateways to public e-mail services such as MCI Mail. And cc:Mail runs smoothly on any server or network operating system, in any configuration. All of which makes it easier for you to maintain, administer, and install. And put your faith in.

LAN TIMES READERS CHOICE 1992

cc:Mail offers an impressive set of administration tools. Such as Automatic Directory Exchange, a product which automatically collects any changes made to the directory and updates the entire network. It's also the

1992 Lotus Development Corporation. All rights reserved. cc:Mail is a trademark of cc:Mail, Inc., a wholly owned subsidiary of Lotus Development Corporation. IBM, OS/2 and PROFS are registered trademarks of International Business Machines

nic mail package
proval from everyone.

first package of its kind that's built on a new, fully scalable messaging architecture. Which means it can accommodate 5 to 500,000 users. And grow along with your business. One more thing: cc:Mail has won every major industry award, including the Windows Magazine 1992 WinAward and ComputerWorld's 1992 LAN Brand Preference award.

INFO WORLD PRODUCT OF THE YEAR 1991

So if you're looking to standardize your e-mail system, look to cc:Mail, the award-winning system that gives you enterprise-wide connectivity, scalability and reliability–the kind

1992 BYTE READER HOT 8 AWARD

nearly 2 million people count on every day.

For a free demo disk of the cc:Mail Macintosh,® Windows,™ UNIX,® or DOS Platform Pack, **call us at 1-800-448-2500.**

With all the stamps of approval we've received, we're still missing one very important one: yours.

Lotus cc:Mail

® a registered trademark of Apple Computer Inc. Windows is a trademark of Microsoft Corporation. MCI Mail is a registered trademark of MCI Communications Corporation. UNIX is a registered trademark of UNIX System Laboratories, Inc.

Muzak offers new tune for data flow

Retailers are increasingly using satellite data transmission to distribute corporate information

BY THOMAS HOFFMAN
CW STAFF

Broadcasters that provide retailers with background music programming via satellite have recently been leveraging their telecommunications capabilities by piggybacking data transfers with mellow music transmissions.

The approach is intended to provide customers with satellite-delivered data services for a fraction of the cost of terrestrial communications.

Witness Muzak Ltd. Partnership in Seattle, known as the world's largest provider of business music to 200,000 subscribers in 15 countries. One of its customers, Taco Bell Corp., the Irvine, Calif.-based Mexican/American fast-food chain, recently began using Muzak's Direct Broadcast Satellite (DBS) service in Raleigh, N.C., to transmit corporate data to more than 2,000 Taco Bell outlets in the U.S.

SATELLITE DATA transmission services are faster and less expensive than leased lines or dial-up modems.

Taco Bell had previously relied on land-based modem communications between its headquarters and stores for routing store sales information.

In October 1990, Taco Bell contracted Muzak to provide its DBS service to the fast-food giant, and the installation of data demodulators throughout Taco Bell is nearly complete, according to a Muzak spokesman.

The service allows Taco Bell to transmit large amounts of data from its headquarters to each of its outlets over the same satellite system that broadcasts Muzak's business music to each Taco Bell store. Muzak leases transponder bandwidth from General Electric Co.'s K-2 satellite and from Microspace, a division of Capitol Broadcasting, which uses a Hughes Aircraft Co. SBS-6 Ku band satellite.

Taco Bell integrated the satellite network with its terrestrial-based communications systems using a software package developed by CMI Software in Waltham, Mass. The terrestrial systems are used by the stores to route smaller amounts of data back to headquarters.

Faster and less expensive than leased lines or dial-up modems, satellite data transmission services are starting to catch on among retailers and other firms, according to Bill Frerich, vice president of research at Black & Co., a Portland, Ore., brokerage firm. Aside from providing business music and data transfer, Frerich said, firms such as Muzak and Broadcast International, Inc. in Midvale, Utah, also provide users with satellite-based check verification, credit-card transaction, electronic mail and teleconferencing services as well.

Several user companies have recently been taking advantage of these services. Wilsooville, Ore.-based Payless Drug Stores, Inc. recently contracted Broadcast International to provide satellite services to 92 additional sites in Washington and Idaho, increasing the oumber of Payless stores on the satellite oetwork to more than 500.

Frerich said British Petroleum Co. PLC uses satellite services in Europe to transmit every transaction its gas statioos process on the continent to its headquarters in Londoo each night.

21 MEGABYTE*

New 3M Floptical* diskettes may look like ordinary 3.5-inch diskettes, but they offer over 28 times the capacity*—at a low system and media cost.

As the world's largest manufacturer of media, 3M is a leader in producing the new Floptical diskette using a unique combination of magnetic-recording and optical servo track technology. Optical tracks are engraved on the barium-ferrite media surface so the drive can read more data more precisely (1,245 tracks per inch vs. 135 on standard floppies). This not only gives you increased capacity but also improved reliability and performance.

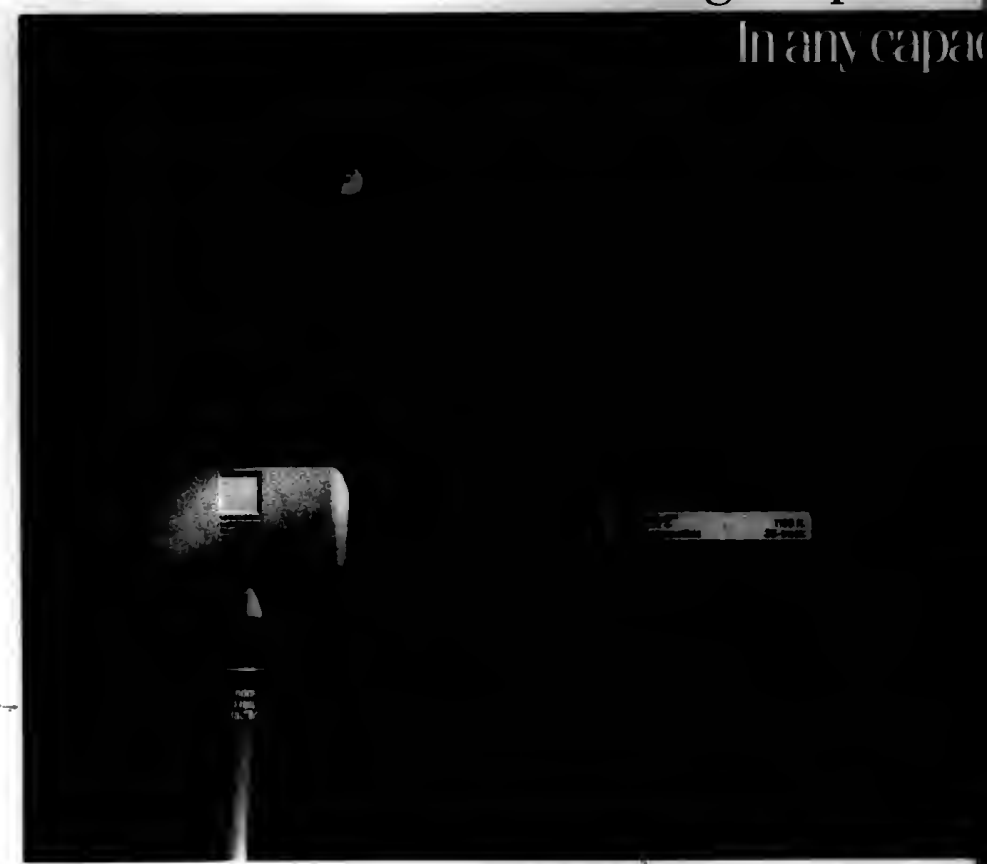
UP TO 24 GIGABYTE

Co-developed by IBM and 3M, the new 3M ECart* ½-inch tape cartridge for the new family of 3490E drives delivers the same proven reliability you've come to expect from 3M 3480 cartridges—with up to twelve times the capacity of the original uncompacted 3480 cartridges, a new shell and improved cartridge handling features.

You'll save time, money and storage space because a single ECart tape cartridge can now store more than two gigabytes of data.

Plug into proven

In any capac



Videoconferences build teams

CONTINUED FROM PAGE 67

"We were watching Max Headroom in slow motion," and there was "a lot of finger-pointing" between carriers New England Telephone Co. and GTE Corp. "You can't ask phone companies to be nice to each other," Martin commented. She noted that now that the issue is resolved, Ben & Jerry's is looking to piggyback other data and voice traffic on the T1 link and maybe cut back on the video bandwith to optimize use of the link.

Videoconferences are held on alternate weeks to support the team communications concept and to help Ben & Jerry's, reputed for its social conscience, cut down on automobile contaminants. Prior to March, team members made regular two-hour road trips between the Waterbury and Springfield sites.

"The price justified itself with travel alone, not counting employee salaries while traveling," Martin said.

While there is a trend for large companies to cost-justify videoconferencing based on travel expenses alone, surprisingly, both PictureTel and its main competitor, Compression Labs, Inc., have recently reported sales downturns, which analysts blame largely on the still-high cost of equipment for midsize corporate budgets.

Ben & Jerry's invested about $140,000 for the two end systems and spends about $2,000 a month for T1 services, Martin said.

To enhance its electronic meetings, the ice cream maker has setup auxiliary cameras to focus on white boards and is considering a document camera to allow users to revise documents together.

The company deferred going to a videoconferencing service, such as those offered by public carriers, or a state-sponsored educational network that allows companies to buy time because "going to another facility defeated the whole purpose," Martin said.

128 MEGABYTE

High capacity in a compact size, 3M 3.5-inch Rewritable Optical Disks give you quick random and direct access to data with the ability to erase and rewrite.

Designed for the rigors of reuse, 3M has combined advanced manufacturing technologies and a patented dielectric layer on the disk surface for more stable, reliable performance and improved media life. Factory formatted to save time, 3M 3.5-inch Rewritable Optical Disks are guaranteed for the life of the product and are available worldwide.

1.35 GIGABYTE

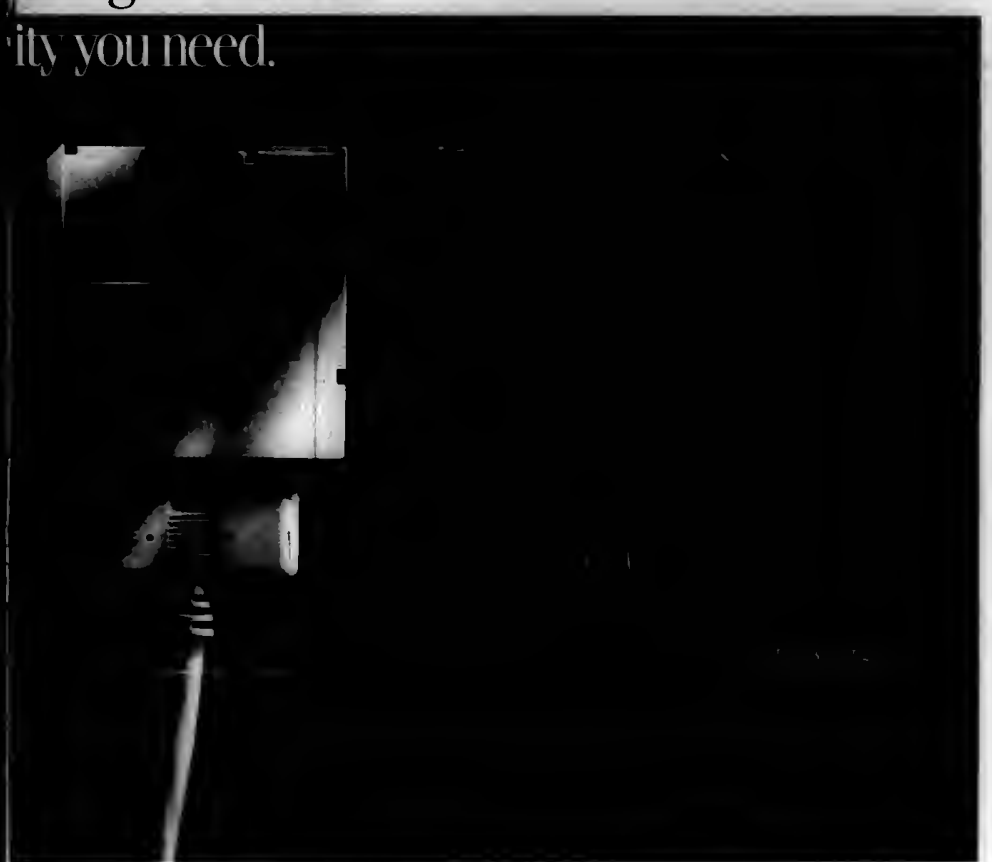
With fast transfer rates up to 36 megabytes per minute and access times faster than 30 seconds, 3M ¼-inch data cartridges offer a fast and reliable choice for data backup. In fact, no other backup media capacity is growing faster—along a planned migration path that will soon reach 10 gigabytes and beyond.

Whether you use our mini ¼-inch data cartridges or need more capacity from 3M Magnus™ 1.35 gigabyte data cartridges, you'll find they're built for durable, reliable performance.

More businesses protect important information on 3M brand data storage products than any other brand in the world. For more information call 1-800-888-1886 ext. 51.

torage solutions.

ity you need.



NEW PRODUCTS

Host-to-host

Systems Center, Inc. has released NDM for Tandem Release 3.0.

The product was designed for Tandem Computers, Inc. computers and enables users to transfer data and integrate production applications with non-Tandem and Tandem computers, the company reported.

NDM for Tandem Release 3.0 connects directly with a variety of platforms, including MVS, VM, VMS, VSE, IBM's Application System/400 and OS/2.

Release 3.0 also connects to PC-DOS running the NDM product and features new connectivity options.

Prices range from $25,000 to $35,000.

Systems Center
1800 Alexander Bell Drive
Reston, Va. 22091
(703) 264-8000

Network services

IWI, Inc. has introduced Communique, remote access and bulletin board system servers.

Communique was designed for Novell, Inc. networks and includes Microsoft Corp.'s Windows 3.1 in its remote access server solutions.

Each of the lines has a 9.6K bit/sec. (V.32) or 14.4K bit/sec.

Continued on page 77

NEED GLOBAL SALES LEADS?

Advertise in Computerworld's new Global Response Cards.

Next ad close: Sept 25

800-343-6474
x757

THE COMPAQ DESKPRO/i. SO A LIMITED PRICE LEADS

The company most qualified to advance the state of the desktop computer announces four systems that represent a breakthrough in R&D. At prices that won't ruin your P&L. Reflecting the level of thinking and quality that you've come to expect from Compaq.

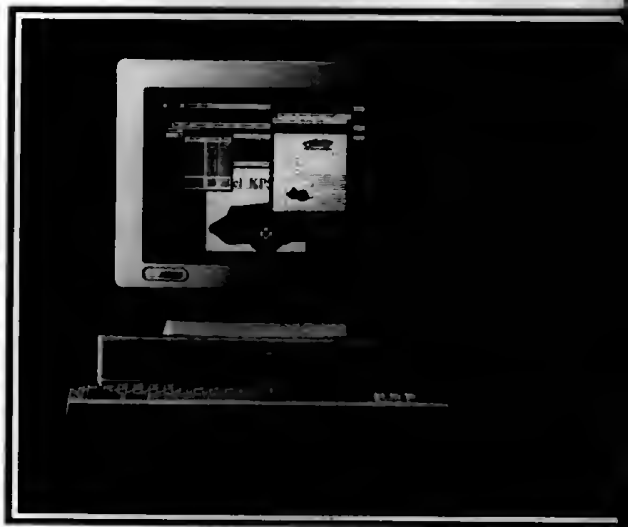
At Compaq, there's a fundamental belief held by all of us that when you set an extraordinary goal, extraordinary people will meet it.

Recently, for example, you made it clear to us that you wanted computers with everything from advanced graphics to audio capability to affordable prices. Our response: the COMPAQ DESKPRO/i Family of PCs. Four new systems loaded with features to enhance productivity.

The built-in COMPAQ QVision 1024 Graphics Controller, for example, allows you to scroll, resize windows and pull down menus up to ten times faster than most popular video graphic subsystems. So quickly, as a matter of fact, you may find your computer waiting for you. Instead of the other way around.

Its unique VersaChip Upgrade Architecture ensures your PC won't be swept into obsolescence.

Simple chip upgradability and a 64-KB cache



†This service is provided by contracted Service Providers and may not be available in certain geographic locations. Contact the Compaq Customer Support Center for further details. *Suggested retail price; reseller price will vary, monitor not included, price indicated is for COMPAQ DESKPRO/i Model 86 not pictured here. © 1992 Compaq Computer Corporation. All Rights Reserved.

MUCH FOR THE IDEA THAT TO LIMITED THINKING.

memory module option provide quantum leaps in performance. Without similar outlays of cash.

Intel 386/25, 386/33, 486SX/25, 486/33, 486DX2/66 ◆ *QVision accelerated graphics* ◆ *VersaChip Upgrade Architecture* ◆ *Integrated business audio* ◆ *4 MB RAM (up to 32 MB)* ◆ *Cache memory standard* ◆ *3 ISA expansion slots* ◆ *3 drive bays* ◆ *84-MB to 510-MB hard drive options* ◆ *Multi-level security features* ◆ *Microsoft MS-DOS 5.0 as published by Compaq*

The integrated audio system provides for an unprecedented, yet not unfamiliar dimension in mainstream business computing: your voice.

The result of a working collaboration between Compaq and Microsoft, it allows you, among other things, to easily paste voice messages into spreadsheets and documents. Either as notes to yourself or as voice-mail across your entire network.

And we've engineered this breadth of technology right onto the PC's system board, preserving the small footprint, large storage capacity and expansion of the COMPAQ DESKPRO/i.

Not to mention your financial integrity.

Add CompaqCare, our new service and support program with our free one-year, on-site† limited warranty. An Asset Management Provision that gives you and your network administrator a snapshot of your PC's configuration. And you have nothing short of a system that breaks a lot of new ground. Without breaking the bank.

For more detailed information, just call us at 1-800-345-1518, ext. 210 in the U.S., or call us at 1-800-263-5868, ext. 210 in Canada.

We bet you'll be as excited about the COMPAQ DESKPRO/i as we are.

Our exclusive VersaChip Upgrade Architecture allows you to expand the COMPAQ DESKPRO/i PC from 386/25 through 486DX2/66.

You can paste voice messages into MS Windows 3.1 documents with our integrated business audio system.

The COMPAQ DESKPRO/i PCs start at just $1779. Our integrated QVision graphics offer "incredible performance—among the fastest we've seen for any system."* —PC Magazine

COMPAQ

COMPAQ, DESKPRO Registered U.S. Patent and Trademark Office. CompaqCare and QVision are trademarks of Compaq Computer Corporation. Product names mentioned herein may be trademarks and/or registered trademarks of their respective companies. The Intel Inside logo is a trademark of Intel Corporation. PC Magazine, July, 1992

The Life of Brian

"We're so confident in our network storage technology, that if you'll send us your network systems administrator for 4 hours, we'll pay that person's salary for a full day," invites Brian Swafford, founder and president of QStar Technologies, Inc.

I Was Just A Kid.

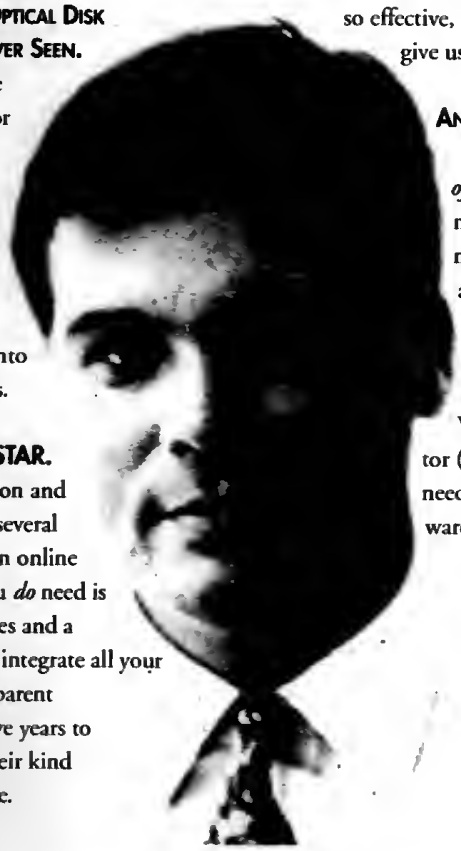
Even when I was young, I wanted to do world-changing kinds of things. I remember wanting to build the ultimate library, where anyone could access every book ever written at the touch of a button. My library would reside on a giant space station.

So I Majored In Math, And Joined NASA.

Actually it was a double major: math and physics. Math for the massively complex file management algorithms, and physics because ... well, getting that much stuff into orbit seemed like a non-trivial physics problem. Is it any wonder I found myself at NASA's National Space Science Data Center heading up Networking and Mass Storage R&D?

I Got To Build The Neatest Optical Disk Networks This Planet Has Ever Seen.

If you've heard of the Space Physics Analysis Network — or SPAN — I worked on it. And on many massive optical storage systems as well. I never did get to build my space station library of every book ever written, but it's amazing just how much information I got into orbit on revolving optical disks.



Five Years Ago I Founded QSTAR.

You don't need a space station and NASA-scale resources to have several hundred GBytes of information online and at your disposal. What you *do* need is commodity mass storage devices and a group of software engineers to integrate all your media into a single, user-transparent storage network. And about five years to craft the only capabilities of their kind available anywhere, at any price.

If You're Worried About Inexpensively Meeting Your End-users' Mass Storage Requirements, We Offer A Unique Solution.

We think it's so unique, that you ought to hear about it. So, we're making you a special offer. If you'll lend us your UNIX network systems administrator for four hours, we'll change — forever — the way you think about solving your network storage problems. Because we offer the *only* platform-independent, network-independent, hardware/software solution available. Period. In fact ...

If You Don't Think Their Time Is Well Spent, We'll Pay You Their Salary For A Day.

I believe we've collected the finest group of network storage professionals ever assembled. The solution they've developed is so effective, I'll put my money where my mouth is. If you'll give us four hours, I'll guarantee your satisfaction.

And If You've Already Made A Buying Decision...

... you can consider your time with us as *peace-of-mind insurance.* Given the big investment you might make on a large magnetic and optical storage network, four hours with us is dirt-cheap insurance. Isn't it?

Call Us Today. 1-800-568-2578.

Ask us to reserve four hours for you in our Visitor's Center. We'll tell your systems administrator (and you, if you care to join us), everything they need to know about networked storage. And afterwards, maybe we can talk about world-changing kinds of things.

QSTAR
TECHNOLOGIES
We aim to make your world better.

Jefferson Plaza • 600 E. Jefferson St., Fifth Floor
Rockville, MD 20852 • Phone (301) 762-9800
FAX (301) 762-9829 • Internet: info@qstar.com

©1992 by QSTAR TECHNOLOGIES. UNIX is a registered trademark of AT&T. TRBA

Continued from page 73

(V.32 bis) high-speed modem.

According to the company, Communique is reconfigurable from 4 lines to 63 lines because of its modular systems.

Communique costs $8,995.

IWI
1648 Mabury Road
San Jose, Calif. 95133
(408) 923-0301

Gateways, bridges, routers

Netronix, Inc. has introduced the TokenMaster series of bridge/routers.

The series includes the new TokenMaster 1000, a low-end remote router, and the TokenMaster 5000, a multiport, multiprotocol device. Routing capabilities have been added to the company's TokenMaster 4000 remote and 2000 local bridges.

The products offer data compression on remote links, 4M/16M byte/sec. Token Ring speeds and complete IBM compatibility.

TokenMaster 1000 costs $2,990. The 2000 costs $4,690, and the 4000 costs $4,990. The TokenMaster 5000 costs $5,990, and the 5-port version costs $7,500.

Netronix
1372 N. McDowell Blvd.
Petaluma, Calif. 94954
(707) 769-3300

Dayna Communications, Inc. has introduced PathFinder.

PathFinder was designed for any size Apple Computer, Inc. AppleTalk network and for users with smaller networks who want to attach LocalTalk to Ethernet. PathFinder offers three modes of operation: RunMode creates an Ethernet and LocalTalk zone on the Internet; a single zone for both Ethernet and LocalTalk is made with the Automatic Mode; and the Configuration Mode provides full configuration while it is connected anywhere on the network.

PathFinder costs $899.

Dayna Communications
50 S. Main St.
Salt Lake City, Utah 84144
(801) 531-0600

X Window Systems

UniPress Software, Inc. has started shipping AutoPlan, a graphical project management system designed for X Window System environments.

AutoPlan can manage projects of up to 10,000 activities and 1,000 resources per project. Its reports can be formatted in Program Evaluation and Review Technique, Gantt and histogram charts, and custom formats can be made using AutoPlan's report writer.

AutoPlan costs $1,495 for a fixed license and $2,995 per floating license.

UniPress Software
2025 Lincoln Highway
Edison, N.J. 08817
(908) 287-2100

Links

Proteon, Inc. has developed a new implementation of the DECnet Phase IV protocol that enables integration of Digital Equipment Corp. and IBM environments.

The new implementation is incorporated into Proteon's router software and has capabilities that enable the DECnet Phase IV protocol to operate over the source routing bridge found in IBM Token Ring internetworks.

DECnet Phase IV end nodes and Proteon routers can cooperate in discovery procedures, which allows the protocol to find the destination of all of the end notes on the network and the route.

Prices for the product start at under $1,000.

Proteon
9 Technology Drive
Westboro, Mass. 01581
(508) 898-2800

ATTENTION VARS!

Increase your sales! Advertise 26 weeks in Computerworld's new VAR Directory. Just $499 for all 26 weeks.

Ad close: Nov 12

800-343-6474
x744

Our new laser printer doesn't make paperwork.

It makes paper work.

Introducing the GENICOM 7170. Superior paper handling solutions for network laser printing.

Our new 17 ppm laser printer lets you put four paper-feeding sources online at one time. Start with dual 250-sheet input cassettes. Then add a duplexer for two-sided printing, a 1500-sheet high-capacity feeder for long jobs and a multipurpose feeder for envelopes, transparencies and labels. Now output to either a 1500-sheet stacker or a 10-bin mailbox sorter, and your very flexible, very affordable workgroup laser printing system is complete.

It talks the talk.

The 7170 features resident PCL 5® and IBM® XL24E emulations. And the optional PostScript® language compatible interpreter provides automatic emulation sensing. Parallel, serial, AppleTalk®, Novell® Ethernet and Token-Ring interfaces are available.

A clear edge in print quality.

Edge-enhancement technology and 300 dpi resolution provide super sharp print quality. A vast array of scalable and bitmapped font styles are resident.

Workgroup-rated performance.

With the 7170, your whole workgroup can print sophisticated graphics and text up to 50,000 pages per month. And like GENICOM's entire family of business printers, the 7170 is backed by our worldwide service and support network. So put your paper to work today, call us at **1-800-4-GENICOM ext. 52.**

GSA Schedule approved.

GENICOM

Printers built for the long run.

One Genicom Drive ● Waynesboro, VA 22980

© 1991 GENICOM Corporation.
All company and/or product names are trademarks or registered trademarks of their respective owners.

Pipeline is a very sane decision.

Build a data warehouse without adding to your wardrobe.

Building an information warehouse with lines and lines of code can drive any application developer crazy. Especially when time is tight and the data critical.

That's when and where PLATINUM Pipeline™ helps.

Pipeline provides for the transparent extraction of data from operational IMS, VSAM, or sequential files to DB2® and the easy propagation of IMS data to DB2. A large array of features gives Pipeline unique means to fully implement the data warehouse concept on an on-going basis.

Pipeline speeds the entire process of building and maintaining a data warehouse in order to keep application developers from going nuts.

Mapping features, to cite an example, allow multiple databases and files to be selectively integrated into DB2 without concern for source data structural constraints. The process is rapid. Prototype tables can be created and assessed for design integrity with minimum effort.

Building a data warehouse is a process, not an act. That's the reason why Pipeline has been designed with a full set of features to provide DBAs and application developers with efficient means to convert and migrate data in order to build a data warehouse better, faster.

PIPELINE
TO BUILD IT BETTER.

Call us now at 1-800-442-6861 ext. 9202 to take the first step toward turning a do-it-yourself project into a do-it-better success story.

Which, considering the real costs of both alternatives, can lead you to the decision to pick Pipeline as your strong suit.

PLATINUM
TECHNOLOGY

PLATINUM *technology, inc.*
555 WatersEdge Drive, Lombard, IL 60148
(708) 620-5000

©1992 PLATINUM technology, inc. All rights reserved. Pipeline is a trademark of PLATINUM technology, inc
IBM and DB2 are registered trademarks of International Business Machines Corporation.

UPS 'Dials' up fast data on deliveries

BY JOHANNA AMBROSIO
CW STAFF

United Parcel Service, Inc. uses a 1.1T-byte DB2 database to confirm delivery of more than 13 million packages each day.

The Delivery Information Automated Lookup System (Dials), one of the largest DB2 implementations in the U.S., provides proof of delivery for customers within one hour of their inquiry.

This is an enhancement to the complete Package Tracking System that allows UPS operators to monitor a package en route and answer customers' inquiries immediately.

Prior to Dials, which was installed in November 1991, delivery information was stored manually, said Robert Omerza, data resource administrator. "This automates the process of getting information to customers," he said. "Customer service is our primary goal."

Dials incorporates a number of elements, ranging from electronic clipboards to personal computers and two IBM mainframe database management systems: IMS and DB2.

The system tracks more than 5 million delivery stops and some 4 million customer signatures each day.

Preventive measures

A modular architecture was chosen so each portion of Dials can continue to run if another breaks down, Omerza said. "If IMS crashes, we can still do inquiries against DB2. If DB2 crashes, we can still upload data into IMS."

Although the database has been stable for a while, Omerza said, the company did have some problems with one of the IMS portions. The architecture worked, he added, because all of the other IMS regions were able to continue uploading data, and the DB2 portion was not affected at all.

The process begins when UPS drivers return from their daily routes. They plug their electronic clipboards — which contain information about when and where deliveries were made — into a giant rack, which charges up the clipboard and moves the data into a PC.

From there, the PC encodes the data and transfers it to the mainframe-based IMS. The data — about 6G bytes' worth each day — is decoded, checked to make sure no duplicate information exists and then sent into DB2.

The firm uses homegrown batch routines to move the information from 20 IMS areas to 20 sets of related DB2 tables. Each of UPS' 20 geographical locations has a corresponding DB2 table.

In total, the DB2 database consists of 148 tables and more than 4,500 physical data sets that require at least 1.1T bytes of magnetic storage. The company purchased 393 IBM 3390 Model 3 disk drives. "That made IBM very happy," Omerza said. Approximately nine months' worth of data is stored on the disk drives.

Optical vs. magnetic

The original plan was to move data after nine months onto optical drives, but that may change, Omerza said. "Optical is slower,

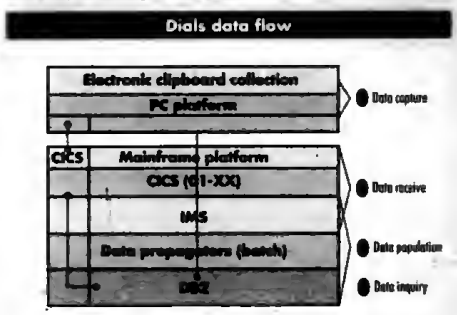
Continued on page 80

ON SITE

United Parcel Service
Mahwah, N.J.

- **Challenge:** To automate the proof-of-delivery process for 13 million shipments per day.
- **Technology:** Combination of electronic clipboards, PCs and two mainframe databases under IBM IMS and DB2.
- **Results:** More than 1,800 UPS field centers can query the system around the clock to find out when a package was delivered.

Data flow
UPS' electronic clipboards feed data up through a PC and an IMS database for access by users under DB2



CW Chart: Janell Genovese

Legent users like workstation move

Say data center tasks much simpler on PCs

BY GARY H. ANTHES
CW STAFF

VIENNA, Va. — Legent Corp.'s move out of the glass house, under way for a year or so, has been generally well-received by customers, who say new workstation-based products have enabled them to boost productivity in their programming shops and data centers.

One such user is TransAmerica Insurance Group in Sacramento, Calif. The company develops Cobol applications for an IBM mainframe using personal computers, development tools from Micro Focus, Inc. in Palo Alto, Calif., and Legent's Endevor products for cross-platform distributed development.

"It's a lot easier to do developing and testing on the PC because tools that are available in Micro Focus Workbench are not available on the mainframe or are available at large cost," said Brian Dehn, senior systems analyst. "Also, it gets people off the mainframe so they are not limited by system availability."

PC possibilities

Dehn said TransAmerica also may buy Legent's Bundl PCView for viewing and capturing mainframe output on a PC. He said this could save the company $100,000 to $200,000 after five years. "That will allow users to download only the data they need, not entire reports taking up massive space on a file server."

Last year, Legent introduced six products that gave users desktop access to mainframe resources (see chart page 85). Although not the first steps in that direction — Legent introduced Automate/XC for DOS-based PCs in 1988 — it marked the first major push in Legent's strategy of moving beyond its traditional mainframe roots.

Users are following suit, although they are not in a rush. "The typical scenario is that organizations are not buying any new [IBM mainframe-based]

> "IT'S A LOT easier to do developing and testing on the PC."
>
> BRIAN DEHN
> LEGENT

3270 terminals," said Jim Snediker, product development vice president. "They are replacing old 3270s with PCs, and initially the PCs are doing 80% 3270 emulation. But once the PCs are in place, they can go and get [PC-based products] so they can do more intelligent interaction with the mainframe."

A systems analyst at a large telecommunications firm who asked not to be named said his company had for years used Legent's MICS family of 3270-based products for collection, analysis and reporting of operations data. Now the company is using MICS EasyReach, which funnels various types of operations data from the mainframe into a PC.

"I've automated the entire reporting process," the analyst said. "It used to be if we did something wrong, we had to start over and reuse mainframe MIPS. Now

Continued on page 85

IF YOUR COMPANY MAILS 500 LETTERS A DAY OUR MAINFRAME SOFTWARE COULD SAVE YOU $1 MILLION A YEAR

Savings of up to 70% are easily achievable. In fact impressive savings begin with as few as 100 letters a day.

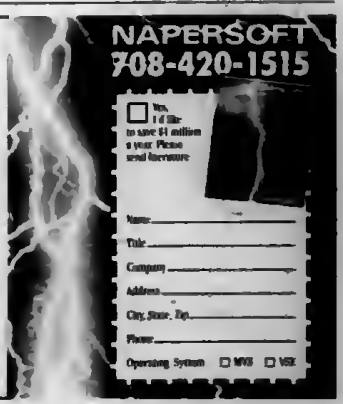
Introducing NAPERSOFT®'s Automated Correspondence Systems (ACS). Discover the awesome power available to support end users in marketing, sales and customer service. Use ACS for seamless integration of personalized form letters with your customer data base. With ACS you're gaining more than a simple letter generator, you're getting a family of powerful new business tools which are easily integrated into your mission-critical, production business systems.

- **NAPER-BRIDGE™ for easy re-engineering of workflows;**
- **NAPER-WORD® for word processing/form letter building;**
- **NAPER-SPELL™ for spell checking, hyphenation and thesaurus;**
- **NAPER-MERGE™ for mail merge and personalization;**
- **NAPER-TOOL KIT™ for on-line letter history and notepads;**
- **NAPER-DOC™ for preparation of documentation and manuals;**
- **NAPER-MERGE Batch Option™ for high volume letter generation.**

NAPERSOFT's ACS can reduce the elapsed time to prepare a letter from minutes, hours and sometimes days... to a few seconds. Cost savings are even more impressive. With the average cost to produce a letter over $10, five hundred letters a day would annually cost about $1.3 million. A savings of 70% puts nearly $1 million back in your pocket. In responding to the challenge of high volume mail, automated correspondence represents a far better utilization of resources than word processing.

If you've been struggling with an in-house solution to the customer correspondence problem take another look at the potential million dollar waste of using word processing for high volume mail... then ask yourself if this isn't an opportunity for you to save your company a lot of money while improving end user support.

For a complete literature pack call 708-420-1515, Or write NAPERSOFT, Inc., One Energy Center, Naperville, Illinois 60563-8466.



Toronto library heeds users; downsizes to mini

BY MARK HALPER
CW STAFF

TORONTO — At the Metropolitan Toronto Reference Library, a decision made last year to downsize its card catalog platform from an IBM 4381 to a Hewlett-Packard Co. minicomputer was a foregone conclusion determined by the library's choice of new software.

The Virginia Tech Library System that Canada's largest reference library selected ran on only one piece of hardware: the HP 3000.

Furthermore, the decision was not one driven by the information systems department. Rather, it was one made by a group of the system's most regular users, according to Olav Vanderzon, manager of the computer operations department.

"The librarians were the ones who made the choice. There were four or five others they looked at," Vanderzon recalled, noting that one option they rejected entailed upgrading the Western Library Network (WLN) program running on the 4381.

So a system that once comprised a 4381 tied to 120 IBM 3178 dumb terminals has given way to an HP 3000 Model 960 linked to about 200 386 personal computers.

Vanderzon says *librarians chose the system themselves*

Good choice

While the librarians may have evaluated systems from a functionality and ease-of-use perspective, their choice yielded some classic downsizing benefits for IS.

Specifically, Vanderzon noted, moving from the 4381 to the HP 3000 Model 960 slashed operating costs from $460,000 per year to $124,000.

Functionally, the HP-based system with its networked PCs introduced a number of advantages over the relatively clunky and terminal-oriented 4381 platform running WLN, Vanderzon said.

Although the 4381 was running at maximum capacity, the library's users were complaining of slow response time and a shortage of on-line information regarding the library's 1.6 million books and 778,000 publications, Vanderzon said.

The transfer from the 4381 to the HP 3000 entailed a conversion of data from Adabase to HP's TurboImage. The library handed that job to Virginia Tech Library System, Inc. in Blacksburg, Va., a Virginia Tech spin-off that took "several months" to complete the task, Vanderzon said.

The purchase and implementation cost the library roughly $2 million, he added. The library received a $3 million grant from the Ontario government, leaving it about $1 million, which Vanderzon said the library will use to upgrade the 960 — perhaps to a more powerful Model 980.

It also plans to spend some of the money buying and installing additional PCs, he said.

Meanwhile, the library has had no luck finding a taker for its 4381, which Vanderzon said has been relegated to "boat anchor" status.

"We're going to have to pay someone to take it away," he noted.

Other downsizing solutions will probably transfer your existing applications to a new environment.

SmartSize with UniKix software, on the other hand, and you can preserve your investment.

A not-so-funny thing is happening to companies that follow the advice of overzealous downsizing proponents. Applications they've used to run their businesses for years are being consigned to the scrap heap. And in the name of progress, no less.

But is it progress to abandon applications of proven value? If this is downsizing, then all the more reason to consider a far more sensible alternative: SmartSizing. Moving to distributed computing environments that integrate new technologies – relational databases, for example – with the existing systems a company already owns and uses.

We're Integris – an organization devoted entirely to helping clients SmartSize. With our UniKix software, we can move existing CICS applications off the mainframe and onto less expensive UNIX* platforms. A move that can produce cost savings of as much as 600%. Without requiring costly training programs new applications invariably call for.

To find out how organizations such as yours are already benefiting from SmartSizing, phone our toll-free number. And by the way, if a downsizing vendor says you ought to scrap your applications, tell him to can it.

INTEGRIS
INTEGRATED INFORMATION SOLUTIONS
1-800-765-2826

© 1992 Integris, a division of Bull HN Information Systems Inc. All rights reserved. *UNIX is a registered trademark of UNIX System Laboratories Inc.

UPS 'Dials' up speedy data on delivery

CONTINUED FROM PAGE 79

so response time is slower. We may wind up just putting more data onto magnetic media."

More than 1,800 UPS field centers can query the DB2 database around the clock to find out when a package was delivered. A printed report is then sent to the customer. Up to 188,000 inquiries can be processed each day.

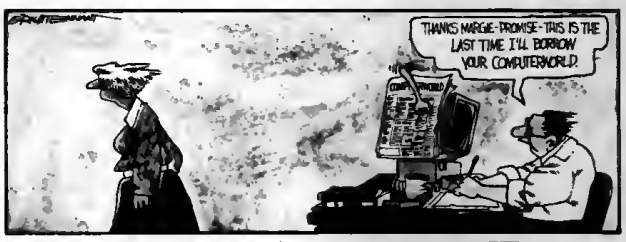
The IMS and the most recent portions of the DB2 database are backed up daily using the DB2 Image Copy Facility. Two sets of backups are made: one for on-site storage and another that is located off-site. The off-site backups run for three hours and use about 300 cartridges each day.

So far so good

So far, Omerza said, "We've had no problems." The biggest challenge has been "learning how to deal with large volumes of data. We have to be very careful because what we do and how we do it can impact the whole business."

Although there are no concrete plans yet, the next step may be to create a separate decision support database — based on summarized information from Dials — that can be accessed by marketing and other departments.

"At this point, our plans are just to continue to populate Dials and let it continue rolling," Omerza said.



YES, I want to receive my own copy of COMPUTERWORLD. I accept your offer of $29.95* for 39 weekly issues — only 76¢ per issue.

First Name MI Last Name

Title Company

Address

City State Zip

Address Shown. ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: $48 per year

* U.S. Only. Canada $74.97. Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

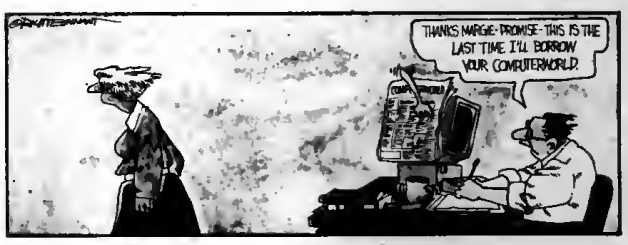
COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
10 Manufacturer (other than computer)
20 Finance/Insurance/Real Estate
30 Medicine/Law/Education
40 Wholesale/Retail/Trade
50 Business Service (except DP)
60 Government - State/Federal/Local
69 Communications Systems/Public Utilities/Transportation
70 Mining/Construction/Petroleum/Refining/Agric.
80 Manufacturer of Computers, Computer-Related Systems or Peripherals
85 System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
99 Computer/Peripheral Dealer/Distr./Reseller
99 Other _____ (Please specify)

2. **TITLE/FUNCTION** (Circle one)
IS/MIS/DP MANAGEMENT
10 Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22 Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt. LAN Mgr., PC Mgr.
23 Dir./Mgr. Sys. Development, Sys. Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Mgt.
99 Sys. Integrators/VARs/Consulting Mgt.
CORPORATE MANAGEMENT
11 President, Owner/Partner, General Mgr.
12 Vice President, Asst. VP
13 Treasurer, Controller, Financial Officer
DEPARTMENTAL MANAGEMENT
51 Sales & Mktg. Management
70 Medical, Legal, Accounting Mgt.
OTHER PROFESSIONAL MANAGEMENT
80 Educator, Journalists, Librarians, Students
90 Other Titled Personnel

3. **IS INVOLVEMENT** (Circle all that apply)
Please indicate your involvement in IS/MIS/DP
A Manage/Supervise IS/MIS/DP Staff
B Recommend/Specify IS Equipment
C Purchase IS Equipment
D End-user of IS Equipment
E No Involvement

E4237-7



YES, I want to receive my own copy of COMPUTERWORLD. I accept your offer of $29.95* for 39 weekly issues — only 76¢ per issue.

First Name MI Last Name

Title Company

Address

City State Zip

Address Shown. ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: $48 per year

* U.S. Only. Canada $74.97. Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
10 Manufacturer (other than computer)
20 Finance/Insurance/Real Estate
30 Medicine/Law/Education
40 Wholesale/Retail/Trade
50 Business Service (except DP)
60 Government - State/Federal/Local
69 Communications Systems/Public Utilities/Transportation
70 Mining/Construction/Petroleum/Refining/Agric.
80 Manufacturer of Computers, Computer-Related Systems or Peripherals
85 System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
99 Computer/Peripheral Dealer/Distr./Reseller
99 Other _____ (Please specify)

2. **TITLE/FUNCTION** (Circle one)
IS/MIS/DP MANAGEMENT
10 Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22 Dir./Mgr. Tech. Planning, Adm. Svcs., Data Center Network Sys. Mgt. LAN Mgr., PC Mgr.
23 Dir./Mgr. Sys. Development, Sys. Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Mgt.
99 Sys. Integrators/VARs/Consulting Mgt.
CORPORATE MANAGEMENT
11 President, Owner/Partner, General Mgr.
12 Vice President, Asst. VP
13 Treasurer, Controller, Financial Officer
DEPARTMENTAL MANAGEMENT
51 Sales & Mktg. Management
70 Medical, Legal, Accounting Mgt.
OTHER PROFESSIONAL MANAGEMENT
80 Educator, Journalists, Librarians, Students
90 Other Titled Personnel

3. **IS INVOLVEMENT** (Circle all that apply)
Please indicate your involvement in IS/MIS/DP
A Manage/Supervise IS/MIS/DP Staff
B Recommend/Specify IS Equipment
C Purchase IS Equipment
D End-user of IS Equipment
E No Involvement

E4237-7

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-4144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-4144

What's in store for future AS/400s?

IBM plans to build on AS/400 success by adding RISC, more network links, other features

BY KIM S. NASH
CW STAFF

Today's IBM Application System/400 is both a mirror reflecting current computing trends and a crystal ball looking into the future.

Some progressive IBM shops are betting that New Age AS/400s will look like a cross between a mainframe and a server. Such companies have configured their shops that way already, banking on IBM to further expand the midrange line's functionality in communications and high-end processing.

Other firms, especially the small and midsize businesses that are bread-and-butter markets for the AS/400, are content to let IBM lead the technological way.

IBM claims an 18% share of the midrange market, up from 10% five years ago. But beyond first-quarter 1993's planned announcement of a new performance-boosting F series line, what does the future hold for the AS/400?

Susan Whitney, midrange systems director at IBM U.S., sees the AS/400 cultivating a "point and shoot" approach to computing. Like an automatic camera that comes packaged with lens, flash and film, AS/400s come with database, systems management and security tools.

"You just plug it in and start," Whitney said.

Users will tell you it may not be that simple, but relative ease of use is frequently cited as a motivation for buyers. IBM's Plug-n-Go and Migrate-n-Grow programs focus on delivering preconfigured, preloaded machines to small businesses. The base price for a low-end model is $11,995.

Here is a glimpse of other developments on the horizon:

RISC: Analysts briefed by IBM expect the AS/400 operating system to get a hefty injection of reduced instruction set computing (RISC) features in 1994. However, rudimentary RISC hooks are expected before then, according to Bill Sines, an analyst at Technology Investment Strategies Corp. in Framingham, Mass. When the F series debuts early next year, it will likely contain RISC hooks in areas such as the input/output controller.

Plus, the recently unveiled 9337 storage subsystem, which marks the entry of Big Blue into redundant arrays of inexpensive disk, or RAID, technology, runs on a RISC processor, said David Andrews, president of ADM Consulting, Inc., in Cheshire, Conn.

Multiprocessors: The E95 four-way processor introduced earlier this month is not the end of the line in terms of number of CPUs, admitted John Thompson, vice president and general manager of Applications Business Systems (ABS), the IBM division responsible for the AS/400 line.

Other sources briefed by IBM confirmed that additional multiway processors are in the works for both the E and the impending F lines.

Thompson has promised a 30% price/performance improvement per year. He added that "developments are coming so fast, you may see us more than one time per year."

Host for downsizers: IBM will continue to grow high-end AS/400s to cultivate mainframe downsizing business, Thompson said.

Companies such as publishing house John Wiley & Sons, Inc. in New York and Access America, a large financial firm in Richmond, Va., have moved the lion's share of applications off IBM mainframes and onto AS/400s.

Sixty percent of all AS/400s installed in the U.S. are located in companies with four or more AS/400s, IBM said.

Frigidaire Co. fits that bill. The Dublin, Ohio-based appliance maker launched a revamped product distribution scheme two weeks ago controlled by a network of AS/400s. Previously, some distribution locations had no computers; other functions were handled by an IBM mainframe.

A more unified approach to shipping management has helped Frigidaire boost warehouse throughput by 30% in pilot projects before the recent formal launch, according to Jack Plieninger, vice president of physical distribution.

What Plieningers said he really liked was modularity in the AS/400. He installed five different sizes of machine, which let him tailor processing power to processing needs.

Communications: Still, not all so-called downsizers are completely ditching mainframes. Many shops plan to keep the big iron to act as communications or database servers [CW, Aug. 17]. That means AS/400s will have to talk to and work with mainframes, tasks that some users and analysts say could use improvement.

Plans are under way with Candle Corp. to build mainframelike Systems Automated Operations utilities to get AS/400s to better communicate with mainframes in networks.

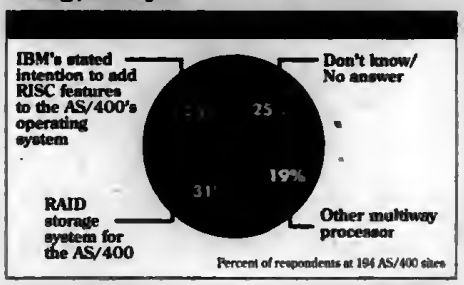
ABS has signed more than 60 development pacts to improve AS/400 interoperability. Although it gave no time frame for actual products, the division promised to meet Posix and Distributed Computing Environment standards.

Image server: The imaging market is not a huge one for IBM. However, ABS is clearly bucking for a piece of the pie. New per-user pricing on ImagePlus should spur sales if initial user reaction is any indication.

Sybron Chemical, Inc., a specialty chemicals maker in Birmingham, N.J., passed over ImagePlus for a personal computer-based alternative two years ago because pricing on the IBM product was "prohibitive," according to Jerry Goldman, director of MIS. However, the idea of using his Model D45 as a server for imaging applications is more attractive now, Goldman said.

Future think

One poll of AS/400 users shows them looking at RAID and RISC technology for the long term



Source: CW Database Division

CW Chart: Janell Genovese

IN BRIEF

CA adds on-line resource center

■ **Computer Associates International, Inc. has announced a CompuServe-based resource center that is intended to provide further support for users of its personal computer, Digital Equipment Corp. VAX, application development and Unix software. The 24-hour-a-day resource center, referred to as GO CAI in CompuServe, is expected to serve 35,000 users in its first year.**

■ **Computer Associates also began shipping CA-Visa, a Motif-based systems management tool for DEC's DEC Windows. The software provides centralized account management for VAXclusters and DECnet networks. The cost of a base license, including software for both client and server, is $2,630. Server-only software is priced at $1,580.**

■ **The American Red Cross said it will spend $3.7 million to install two Unisys Corp. A 16 mainframes at its Northeast region branch in Dedham, Mass. The move is part of a nationwide program to revamp the Red Cross' blood-tracking computer systems [CW, June 8]. Once the A 16 mainframes start running the Blood Center Management System software, the Dedham site will start to support Southern U.S.-based blood centers.**

LINK IT.

TERRANOVA Communications.

Linking your desktop or laptop to other computing systems for integrated, two-way data communication is easy with TERRANOVA.

And because it runs on either Microsoft Windows*/MS DOS* or UNIX**, TERRANOVA is easy to use, too.

What's more, it has built-in features other software packages offer at an extra cost. That means you can take advantage of emulators, remote and network print spooling, Central Software Administration, PC Backup, Restore to Host and a "front end" menu system right away. All without the added expense.

To find out how easy TERRANOVA can fit into your operations and your budget, call 1 800 462-8146 or fax us at 1 908 580-6355. We'll also send you a free copy of our "AT&T Software Solutions Catalog."

SOFTWARE SOLUTIONS GROUP

Innovation you can depend on.

AT&T

Copyright 1992 AT&T *Microsoft Windows and MS-DOS are registered trademarks of Microsoft. **UNIX is a registered trademark of USL.

SECURITY CHECK

James Daly

Virus shots

Take two hard disks and call me in the morning. There's been some discussion lately about mainframe viruses — mainly, "Do they exist?" Well, the answer is yes — but don't go scurrying for the aspirin just yet.

Although mainframe viruses are rare, they can certainly be created, and some have even become widespread. Witness the famous CHRISTMA EXEC file that flashed a Christmas message to VM users on IBM's corporate network in 1987. But in general, we do not see viruses become endemic on mainframes the way we have on PCs.

There are several reasons for this, some technical and some cultural. Viruses don't become widespread unless they can spread faster than they are caught.

David M. Chess, a research staff member at the Hawthorne, N.Y., offices of IBM's Thomas J. Watson Research Center, notes: "There are many fewer people walking around with tape reels in their back pockets than there are people with diskettes. The micro world is just a more tightly connected graph and has many more nodes than the mainframe world." Access controls on mainframes would also slow spreading to a crawl.

In other words, someone *could* write a mainframe virus, but it'd be unlikely to get anywhere before becoming extinct.

Get me an Orange Whip and a seat on the aisle. If you haven't done so over the weekend, check out *Sneakers*, a new film from Universal Pictures that features an endless parade of cryptologists, wiretappers, FBI men, cyberpunks and the National Security Agency.

The plot involves a tiger team hired to break into places to test their security as well as a mysterious "black box" that can potentially decode any computer data in the world.

A hacker friend (well, ex-hacker, or so he claims) who sat through a screening gave it one binary digit up.

The movie — which stars such silver screen luminaries as Robert Redford, Dan Ackroyd, Ben Kingsley, Sidney Poitier and River Phoenix — raises some interesting questions, such as how can you trust the information you receive from a computer if it's transmitted over such insecure media?

The title? Oh, it's an old IBM nickname for flashy kid programmers.

Is the Unix password Mitzy or Rover? In these days of multiplatform activity, it's easy to drive users bonkers by making them memorize a dozen or more passwords in order to move around electronically.

Multiple passwords can also present a higher security risk because end users are more likely to write those varied passwords down than commit them to memory.

One possible solution was introduced at the recent Downsizing Expo in San Francisco: Single Sign-On from Rocky Hill, Conn.-based Pyramid Development Corp. Single Sign-On enables authorized users to access any number of computing platforms via a single password. Single Sign-On is a companion product to Pyramid's PC/DACS workstation security software package.

You say tomayto and I say tomahto. Think you've uncovered a new virus? Not so fast. The Antivirus Methods Congress (AMC) wants people who think they've stumbled on some as-yet-undiscovered rogue code to consult the AMC's international directory of viruses before they give it a name. Software publishers should also consult the directory before they create antivirus programs.

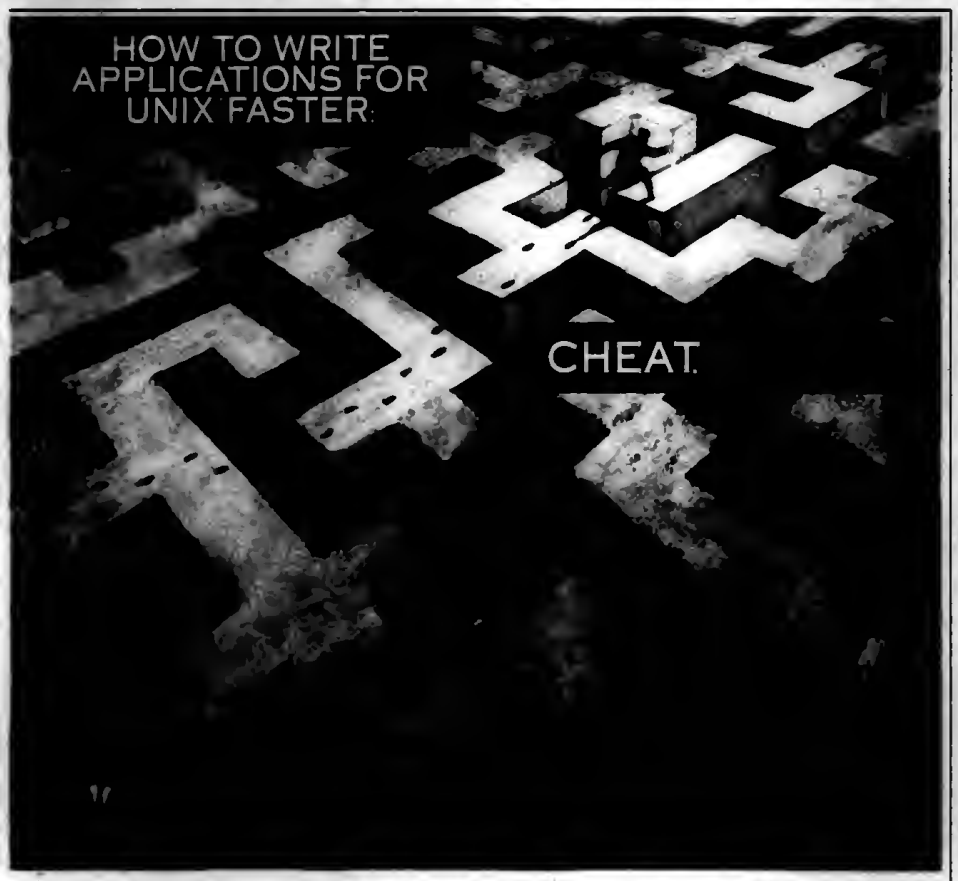
Not only will standard naming "minimize the wasteful rediscovering of old viruses but it will also avoid confusion over what commercial virus scanners can and cannot detect," AMC President Richard Lefkon said.

For more information about the directory, contact Lefkon at 609 West 114th St., New York, N.Y. 10025 or call (212) 663-2315.

And this one fills your mind with empty promises until election day. Heard about the spate of new viruses named after the big political blowhards? Probably not, but their descriptors are having fun and keeping folks chuckling on the bulletin boards.

A small sample: George Bush Virus (doesn't do anything, but you can't get rid of it until November); Bill Clinton Virus (mutates from region to region; won't let PC inhale data); H. Ross Perot Virus (produces a blank screen, but it appears to have had a lot of money put into its development); Pat Buchanan Virus (shifts all output to the extreme right of the screen); David Duke Virus (makes your screen go completely white); Congress Virus (overdraws your disk space); Richard Nixon Virus (you can wipe it out, but it always makes a comeback); and the Warren Commission Virus (won't allow you to open your files for 75 years).

Daly is a *Computerworld* West Coast senior correspondent.



If you're trying to write business solutions for UNIX, you know one thing for sure: The backlog can be backbreaking.

So in the spirit of helpfulness, we offer you the perfect answer.

Cheat.

Actually, we offer you two ways to cheat. Which is twice as good. And both involve uniVerse by VMark.

Through VMark Software, you have access to approximately 4,000 proven, reliable business solutions, as well as industry expertise, for a broad range of vertical markets, including distribution, manufacturing, financial, government and health care. And uniVerse lets you run them on over sixty platforms from virtually every manufacturer in the world.

So you can have the application you want, when you need it, and on the platform you prefer.

The second route to fast UNIX solutions involves taking advantage of uniVerse's second big attribute. It is, we believe, the easiest application development environment in use today. And the applications you build will be able to take full advantage of all the benefits and freedom of choice that make UNIX and open systems so attractive.

VMark. Think of us as business solutions for UNIX. To go.

To learn more, write or call (508) 879-3311.

uniVerse by VMARK SOFTWARE

NORTH AMERICA · EUROPE · ASIA-PACIFIC

VMark Software Corporation 30 Speen Street, Framingham, MA 01701 Tel (508) 879-3311 FAX (508) 879-3332 uniVerse is a trademark of VMark Software. UNIX is a trademark of UNIX System Laboratories.

Moving To UNIX? Stop Here First.

Join Computer Associates And Hewlett-Packard At A Free Half-Day Briefing For CIOs, IS Executives And UNIX System Managers.

"Shows how CA and HP make downsizing to UNIX practical for mission-critical applications."
Bernard Guidon, GM, General Systems Div., Hewlett-Packard Co.

"An excellent source of answers."
Assistant Director, Grumman Data Systems

"Fantastic."
VP, Data Admin., Options Clearing Corp.

The experts agree: if your future includes UNIX, this seminar is a must. "Overcoming The Barriers Of Downsizing To UNIX" helps you avoid the pitfalls and migrate safely to open systems.

Topics discussed include: solutions to thirty challenges you'll face managing UNIX; security methods for distributed environments; case studies on downsizing mainframe database applications; powerful new systems administration solutions; and practical action plans for making it all work.

Don't miss this important educational opportunity. Register today!

Albany, NY	*8/20, 10/15, 11/19*	New York	*8/11, 10/6, 11/10*
Albuquerque	*9/8, 11/19*	Oklahoma City	*8/11, 10/22*
Atlanta	*8/20*	Omaha	*9/9*
Austin	*7/30, 8/25, 11/5*	Orlando	*8/19*
Baltimore	*9/17*	Paramus	*8/20, 10/6, 11/17*
Baton Rouge	*10/28*	Phoenix	*8/6, 9/1, 10/14, 11/12*
Birmingham	*9/22*	Piscataway	*9/15*
Boise	*8/12, 9/10, 10/20, 11/18*	Pittsburgh	*9/17*
Boston	*8/13, 10/8, 11/12*	Portland	*9/17, 11/24*
Buffalo	*8/26*	Raleigh	*9/10*
Charlotte	*9/16*	Richmond	*8/27*
Chicago	*8/27*	Rochester	*8/25, 10/20*
Cincinnati	*8/25, 10/20*	Salt Lake City	*8/5, 9/3, 10/13, 11/11*
Cleveland	*8/26, 10/21*	San Francisco	*7/24, 10/20*
Columbia, SC	*10/8*	San Jose	*10/6, 12/9*
Columbus, OH	*9/16*	Seattle	*8/13, 11/4*
Dallas	*7/28, 8/26, 10/8, 11/3*	Shreveport	*11/19*
Denver	*8/4, 9/2, 10/15, 11/10*	Springfield, MO	*10/6*
Detroit	*9/1*	Stamford, CT	*8/18, 10/13, 11/17*
El Paso	*8/13, 10/21*	St. Louis	*9/2, 10/15*
Ft. Lauderdale	*9/1*	Syracuse	*10/21*
Ft. Wayne	*9/8*	Tallahassee	*10/29*
Grand Rapids	*8/11*	Tampa	*9/23*
Greenville, SC	*9/15*	Topeka	*11/18*
Houston	*7/29, 8/27, 10/6, 11/4*	Tulsa	*9/9, 11/17*
Indianapolis	*9/3*	Valley Forge	*10/9, 11/18*
Jackson, MS	*10/1*	Washington, DC:	
Jacksonville	*11/11*	*(Falls Church, VA)*	*8/26, 9/24, 10/15, 11/19*
Kansas City, MO	*9/10, 10/14*	*(Rockville, MD)*	*8/20, 10/8, 11/12*
Little Rock	*11/12*	Wichita	*8/27*
Los Angeles	*9/4, 11/17*	**CANADA**	
Louisville	*9/9*	Calgary	*9/24*
Madison, WI	*9/2*	Edmonton	*9/28*
Memphis	*9/30*	Halifax	*10/8*
Miami	*10/7*	Montreal	*9/15*
Milwaukee	*9/3*	Ottawa	*9/17*
Minneapolis	*8/26*	Regina	*9/30*
Mobile	*10/20*	Toronto	*10/6, 11/17*
Nashville	*9/16*	Vancouver	*9/22*
New Orleans	*9/24*	Winnipeg	*10/2*

To Register, FAX This Form To 1-516-342-5734. Or Call Dana Williams At 1-800-225-5224.

Name(s) _____

Company _____ *Title(s)* _____

Address _____

City _____ *State* _____ *Zip* _____

Phone Number(s) _____

☐ I Cannot Attend, But Please Send Seminar Materials.

Seminar Location _____ *Date* _____

COMPUTER ASSOCIATES
Software superior by design.

© Computer Associates International, Inc., One Computer Associates Plaza, Islandia, NY 11788-7000. All product names referenced herein are trademarks of their respective companies.

NOW THIS IS WHAT WE CALL DOWNSIZING!

Goodbye ol' mainframe computer!
Industry leaders have already decided to go to faster/smaller/less expensive computers based on open system standards. And Data General is leading the way! Our AViiON® Systems can give you 117 MIPS of mainframe power that fits in a pizza box, for a downsized starting price of under $75,000. Sound unbelievable? Try this–our newest AViiON can give you 235 MIPS with an 8-way processor for a starting price under $200,000. Here is what AViiON can mean to your business:

- Increased savings because AViiON costs millions less than traditional mainframes–plus you save on maintenance, software, power, and much more!
- Increased productivity because AViiON allows your different computers to work together as a corporate resource.
- Increased information storage capacity and security thanks to the availability of AViiON's fault tolerant disk array.
- Increased and immediate "mainframe class" performance using the leading databases, business applications and communications software.
- Increased envy from your competitors because you took advantage of open systems for a competitive edge.

Data General AViiON Systems.
That's where the world is going.
And we want to take you with us.
Call 1-800-DATA GEN

Data General
Where the World is going!

© 1992 Data General Corporation
AViiON is a registered trademark of Data General Corporation

The AViiON System. Mainframe power that fits in a pizza box and saves you millions!

Soft·Switch

Seminar Series Registration Card

❑ I want to learn more about interoperability among standards, how to integrate my existing systems, and what it takes to effectively manage an enterprise E-mail network.

Name _____

Title _____

Company _____

Address _____

_____

City/State/Zip _____

Phone _____

Please check the city in which you will be attending the Soft·Switch seminar:

❑ Albuquerque, NM 10/28/92
❑ Atlanta, GA - 10/6/92
❑ Boston, MA 11/17/92
❑ Chicago, IL - 9/17/92
❑ Cincinnati, OH - 12/1/92
❑ Cleveland, OH - 12/3/92
❑ Dallas, TX 10/13/92
❑ Denver, CO - 9/24/92
❑ Detroit, MI 11/4/92
❑ Houston, TX 10/14/92
❑ Indianapolis, IN 10/14/92
❑ Los Angeles, CA 9/22/92
❑ Minneapolis, MN 10/22/92
❑ New York, NY - 9/30/92
❑ Orange County, CA - 10/8/92
❑ Pittsburgh, PA 10/22/92
❑ Princeton, NJ - 10/13/92
❑ San Francisco, CA 9/24/92
❑ Santa Clara, CA - 9/23/92
❑ Washington, DC - 9/29/92

❑ Unfortunately, I cannot attend any of the seminars at this time, but please let me know about future educational opportunities.

Or call 1-800-899-5465 Ext. 830

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO 27 WAYNE,PA

POSTAGE WILL BE PAID BY ADDRESSEE

Soft·Switch

640 Lee Road
Wayne, PA 19087-9953

Legent users like workstation move

CONTINUED FROM PAGE 79

we just get the data off the mainframe and manipulate it on the PC to our heart's content." He said new performance reports that required a day or more to develop on the mainframe can now be done in an hour or so.

To make its mainframe offerings reach out to the desktop, Legent turns the mainframe product into a file server component, then develops an "outbound" component based on object-oriented designs and graphical user interfaces, said Paul Johnson, product development vice president. For example, Endevor Workstation is essentially a rewrite of Endevor/MVS as a single C kernel with separate C++ shells for DOS, Windows and OS/2.

Vague promises

Many of Legent's 130 products do not yet allow workstation access, but Johnson promised further announcements of the type made last year. "Our direction is to do more of the same," he said, declining to be more specific.

"Legent's strategy is going quite well, and over the next 12 months, you'll see even more workstation-based management tools for distributed systems and for mainframes," said Dale Kutnick, president and research director at Meta Group, Inc. in Westport, Conn.

Kutnick estimated that workstation-based tools account for less than 5% of the $3 billion-plus systems management market at present, but he said that would increase to 40% or so of a $6 billion market by 1997.

Some users said the pairing of the mainframe and PC components is a step forward but not necessarily the ultimate solution.

For example, Mitsubishi Electronics America, Inc. in Cypress, Calif., is beginning to use SAR/PC to download mainframe report data to a PC for manipulation in Lotus Development Corp.'s 1-2-3. Danny Rhyan, manager of data center operations and telecommunications at Mitsubishi, said, "We see this as a good bridge — at least for the near future — between the glass house and the client/server environment we are all moving toward."

Bethlehem Steel Corp. is using AutoMate/XC at its Bethlehem, Pa., headquarters to automate initial program load (IPL) on its mainframes, which used to require tedious and error-prone keying of responses to system prompts at the hardware console. Now, automated scripts on PCs re-IPL multiple logical partitions on the mainframes.

Greg Thomas, senior technical analyst at Bethlehem Steel, said AutoMate/XC is being used with Carbon Copy Plus from Microcom, Inc. in Norwood, Mass., to do remote IPLs and monitor two mainframes at a satellite data center in Burns Harbor, Ind.

Carbon Copy allows systems personnel using a PC at headquarters to "acquire the keyboard and screen image" of a Burns Harbor PC running AutoMate/XC to control the remote mainframes.

"That allowed us to consolidate that complete operation into here, so people out there were displaced," Thomas said.

Legent's lineup

Endevor workstation	Software management (version control)	150
AutoMate/XC for OS/2	IBM, DEC, Tandem console automation and remote operations	150
Bundl PCView	PC access to mainframe reports	25
OptiModel	IBM mainframe capacity prediction and management	99
MICS EasyReach	Access to mainframe system management information via Microsoft's Windows	61
SAR/PC (with Express)	On-line viewing of computer output	110

Source: Legent Corp. CW Chart: Janell Genovese

NEW PRODUCTS

System software

Empact Software has introduced a new release of Budget-DASD..

Budget-DASD provides a storage component with facilities to monitor and control direct-access storage device (DASD) space consumption.

Version 1.2 has an enhanced ISPF interface, flexible report-formatting and new features for both volume level accounting and resynchronization, according to the company.

CPU licenses for Budget-DASD begin at $8,000.

Empact Software
2375 Wall St.
Conyers, Ga. 30208
(404) 483-8852

Software application packages

Nova Systems, Inc. has introduced Version 3.0 of Reveal for DB2.

Reveal is an on-line reference and training tool. The product includes application performance issues, tuning and debugging techniques, name standards plus command syntax and parameters. A new Hypertext Referencing feature lets users access Reveal through 3270 emulation.

Prices start at $2,500.

Nova Systems
11209 Prince Court
Fredericksburg, Va. 22407
(703) 891-1303

Free Educational Seminar Locations and Dates:

Albuquerque, NM
Hyatt Regency
Wednesday, October 28

Atlanta, GA
Atlanta Marriott Marquis
Tuesday, October 6

Boston, MA
The Westin Hotel
Tuesday, November 17

Chicago, IL
Chicago Marriott Downtown
Thursday, September 17

Cincinnati, OH
Marriott
Tuesday, December 1

Cleveland, OH
Airport Marriott
Thursday, December 3

Dallas, TX
Marriott Park Central
Tuesday, October 13

Denver, CO
Denver Marriott West
Thursday, September 24

Detroit, MI
Hyatt Regency
Wednesday, November 4

Houston, TX
Hyatt Regency
Wednesday, October 14

Indianapolis, IN
Marriott Courtyard
Wednesday, October 14

Los Angeles, CA
Westin Bonaventure
Tuesday, September 22

Minneapolis, MN
Minneapolis Airport Marriott
Thursday, October 22

New York, NY
Helmsley Palace
Wednesday, September 30

Orange County, CA
Irvine Hyatt Regency
Thursday, October 8

Pittsburgh, PA
Hilton Hotel & Towers
Thursday, October 22

Princeton, NJ
Hyatt Regency
Tuesday, October 13

San Francisco, CA
Sheraton Palace
Thursday, September 24

Santa Clara, CA
Renaissance Cnr-TECHMART
Wednesday, September 23

Washington, DC
Hyatt Regency Crystal City
Tuesday, September 29

Due to overwhelming response, additional cities have been added. Please call Soft•Switch for more information.

Building and Managing Enterprise Mail Networks

The opportunity to enhance your organization's effectiveness is here. Our educational seminars will clearly explain the issues and answers you need!

The issues — the emerging role of X.400 and X.500; interoperability among international and *de facto* standards (X.400/X.500/X.700, SMTP/MIME); integration of existing systems; and effective network management.

The goal is clear — an open, manageable, and secure E-mail backbone that enables efficient communication, so critical to today's business environment.

The problem is getting there — today's installed base of systems is unmanageable and not open, based on proprietary technology, and not predicated on a backbone approach to enterprise mail.

The challenge is two-fold — defining the right architecture for an enterprise mail backbone, and defining the migration path necessary to get from the present to the future.

Helping You Realize The Goal

For years Soft-Switch has helped the world's largest corporations and governments implement reliable electronic mail networks supporting thousands of users. With distributed technology product offerings like EMX™ and Soft-Switch Central, organizations of any size can now benefit from Soft-Switch's knowledge and experience.

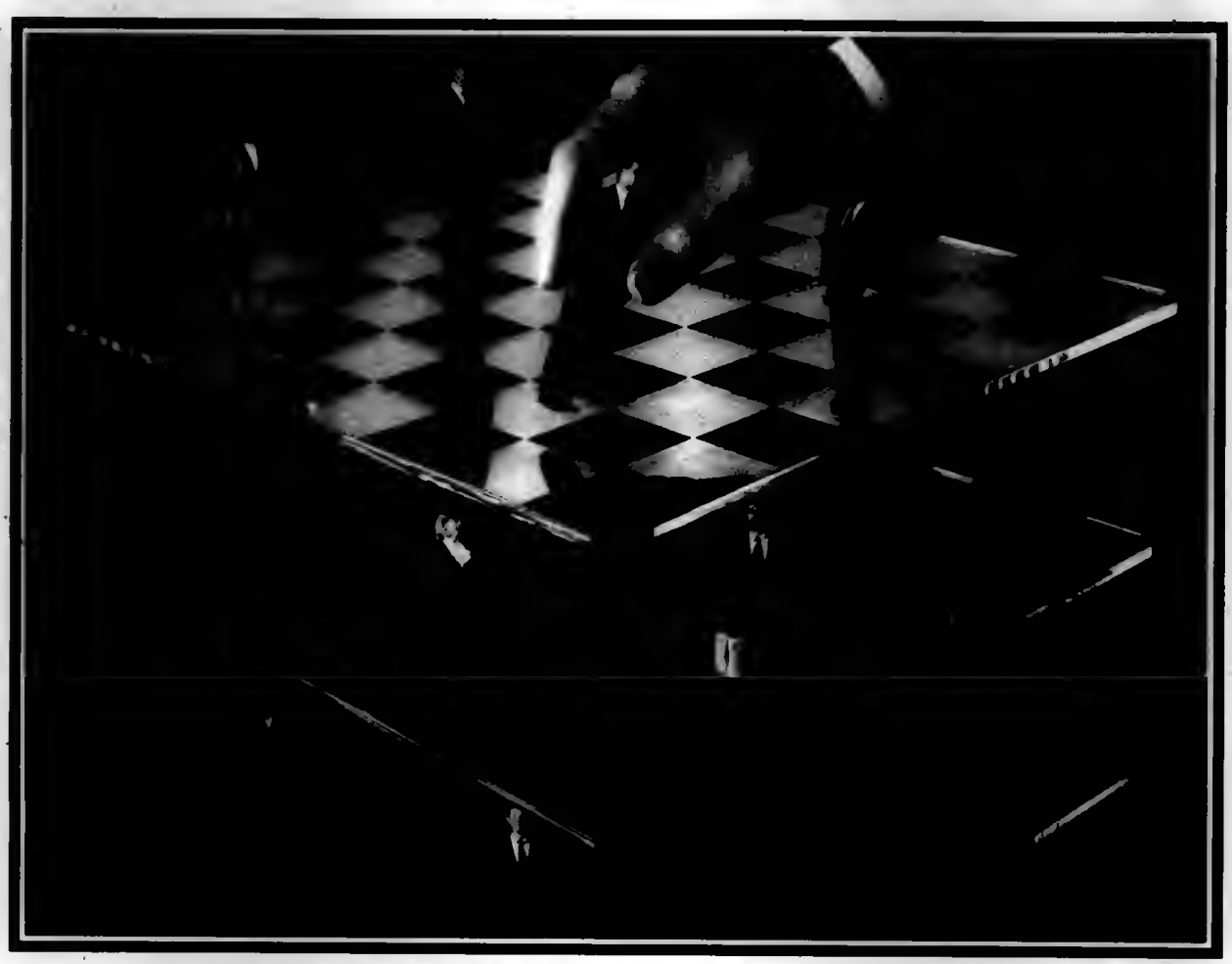
Our educational seminars will clearly explain the issues and answers you'll need to know! Seminars are offered free of charge, and will be held from 9:00 AM to Noon. Space is limited, so register today.

To register, please call 1-800-899-5465 Ext. 830.

Soft-Switch

Soft-Switch, Inc., 640 Lee Road, Wayne, PA 19087
1-800-899-5465 Ext. 830, 215-640-9600

YOU CAN'T KEEP THE COMPETITION IN CHECK UNLESS YOU ANTICIPATE ALL THEIR MOVES.



FOCUS FROM INFORMATION BUILDERS: Nothing Else Lets You Analyze And Utilize Mission Critical Information From Any Database On Any Platform.

UNMANAGEABLE DATA WILL NEVER BE INFORMATION

If only there was a way to work with different DBMS, on different platforms, with a single set of software tools.

A way to develop applications using all your data, no matter where it is, to run transparently on any platform.

A way that avoids system bottlenecks and fully utilizes your information investment, so that mission critical never becomes mission impossible.

THERE IS A BETTER WAY

It's called FOCUS from Information Builders. The specialists in distributed information systems.

And with more than one million users in every one of the Fortune 100, FOCUS is the number one 4GL for end-user computing and application development.

OO ANYTHING WITH INFORMATION

FOCUS is powerful enough to provide decision support features like business graphics, spreadsheets and the best report writer in the business. With an unmatched ability to control and integrate critical information systems within your enterprise, FOCUS lets departmental users maintain applications that meet their requirements.

YOU WANT IT, FOCUS CAN CREATE IT

With comprehensive built in tools you get the flexibility to develop anything from highly structured data management applications and decision support systems, to simple ad hoc queries and reports.

With FOCUS, data becomes information, and isn't that exactly what you've always wanted?

So let your competition make the wrong moves while you make the winning one.

For more information on FOCUS and how it can fulfill all your data management needs or to attend a FREE Seminar...

Call 1-800-969-INFO
In Canada call 1-416-364-2760

IBI FOCUS
Information Builders, Inc.

FOCUS is a Registered Trademark of Information Builders, Inc. 1250 Broadway New York, NY 10001

IN BRIEF

Tiburon adds tests

■ The test products group of San Jose, Calif.-based **Tiburon Systems, Inc.** has added software testing and quality assurance training to its line of services. The company, which released its platform- and operating system-independent Ferret System software testing program earlier this year, said it will now offer independent software testing to commerical and corporate software developers. Tiburon recently signed testing contracts with Borland International, Inc. in Scotts Valley, Calif., and Atlanta-based Peachtree Software, Inc.

■ European expenditures on computer-aided software engineering (CASE) tools grew by 28% in 1991, according to a recent report by London-based market research firm **Ovum Ltd.** CASE expenditures grew by 39% in 1990, the firm said. Ovum noted that CASE investments in Germany are expected to increase by 32% during 1992.

Visix's Galaxy explores new territory

BY GARRY RAY
CW STAFF

Patriot Partners folded and lost millions trying to do it. Lotus Development Corp. founder Mitch Kapor tried it too, but backed off after more than a year of effort. Only time will tell whether Taligent, Inc., a Cupertino, Calif.-based alliance of IBM and Apple Computer, Inc., will succeed where others have failed.

But Reston, Va.-based Visix, Inc., developer of the Looking Glass desktop manager for Unix workstations, is on the verge of announcing a platform- and operating system-independent development environment.

The Galaxy environment was designed for five major platforms: Microsoft Corp.'s Windows and Windows New Technology (NT); SunSoft, Inc.'s Open Look; the Open Software Foundation's Motif environments for Unix; and the Apple Macintosh.

Galaxy, which is scheduled to be announced and partially shipped in November, will allow users to create multiplatform, client/server applications using a single set of identical development tools, application programming interfaces (API) and other services.

Ultimately, it will allow developers to write a single application on any platform and easily recompile it for use on another, according to developers, analysts and observers who have seen early versions of the environment.

"This is the first product that is a true client/server application builder," said Judith Hurwitz, editor of Newton, Mass.-based "Client/Server Toolwatch," an industry newsletter. "You could do your development once and migrate [the application] to any other platform."

Various functions

Galaxy is roughly divided into three major layers of functionality, according to other observers. Comprising a user interface layer; a compiler, library and services layer; and an application and runtime layer, it will be delivered with six development tools.

These will include a graphical user interface builder; a Help system authoring tool; a Help system server; a color image editor for animation and multimedia applications; a project browser to be used for version control; and a programmable text editor.

"Their [tool] support is incomparable to anything that currently exists in Unix," said Nik Ivancic, senior staff engineer at Metaphor, Inc. in Mountain View, Calif., and a former software project director for Patriot Partners, the now-defunct IBM and Metaphor partnership that attempted to design a similar environment.

"You can do serious things in one afternoon," using the Galaxy tools and services, he said.

As for its client/server elements, Ivancic said Galaxy's distributed application services (DAS) server duplicates a number of communication functions that are expected to be implemented in Windows NT, such as named pipes, remote procedure calls and shared memory, that are currently available in most Unix implementations.

However, he said DAS implements these services in a manner that makes them accessible to any application running on any supported platform through the Galaxy API.

That ensures portability of applications and a reduction of programmer effort in writing client/server programs, he added. "There are lots of little communication details that are unorganized [in operating systems]. Structuring and organizing those is what DAS will give you."

What it supports

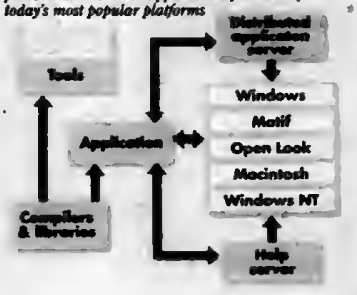
Other sources said Galaxy DAS will support a variety of networking, communication and file-sharing protocols, such as SunSoft's ToolTalk, Apple's Publish and Subscribe, Microsoft's Object Linking and Embedding and Dynamic Data Exchange and the Object Management Group's Object Request Broker. Hurwitz added the DAS "attaches to whatever network is there."

Visix officials were reluctant to comment on Galaxy.

"The product will be announced and in general release by November," according to Visix director of product marketing Tom Axbey.

Galaxy

Visix's Galaxy development environment promises portable tool sets and applications for some of today's most popular platforms



CW Chart: Michael Siggins

Independent tool sets catching on

BY JEAN S. BOZMAN
CW STAFF

Open systems should have open tools. That's what users say, as they map out client/server applications that draw on multiple databases scattered throughout their companies.

But industry analysts said they believe that a relative handful of users are using open — or independent — tool sets to integrate data across an enterprise (see chart at right). More often, users are picking the independent tool set they like most, but they are taking on only one database application at a time.

"In the past, people have typically used tools that were well-integrated with their primary database," like Sybase's APT Workbench or Oracle Corp.'s SQL Forms, said John Morrell, a senior analyst at International Data Corp. in Framingham, Mass. "But the people who buy an independent tool set are looking for a top-to-bottom solution, with a fourth-generation language (4GL), a relational database and more robust features."

A wide variety of independent tool sets are available, including well-established systems from Uniface Corp., Unify Corp., JYACC, Inc., PowerSoft Corp., Information Builders, Inc. and Gupta Technologies Corp. Others are available from a new crop of start-up vendors, including Trifox Corp. and Cooperative Solutions, Inc.

With all of those choices, users are ready to go shopping. And they have a laundry list of reasons for going to open tools for database applications development. "You may want to have one look and feel for the tool set your developers use, or you may want to insulate yourself from changes among vendor companies," suggested Michael Corey, a vice president at Database Technologies, Inc., a Boston consulting firm. Large multinational firms have reason to do both because most have multiple databases, Corey said.

Many sites need to combine data from legacy databases with data stored in new relational database management systems. Clayton Environmental Consulting, a 500-employee firm in Novi, Mich., uses Progress Corp.'s 4GL to write applications that access both a Progress RDBMS and a large legacy database of Digital Equipment Corp. RMS flat files. "We can treat the RMS files exactly as we would a Progress file, and we don't have to do any SQL coding," said Dave Drummond, a senior systems analyst. Clayton has written more than 10 Progress applications in

Continued on page 90

Open tools

Some open systems DBMS development tools and samples of the DBMSs they support

Uniface Corp. Product: **Uniface**
DBMS support includes: Oracle, Sybase, Informix, Ingres, DEC's Rdb, Microsoft/Sybase SQL Server for OS/2

Unify Corp. Product: **Accell/SQL**
DBMS support includes: Oracle, Sybase, Informix, Unify 2000 database

Gupta Technologies, Inc.
Product: **SQLWindows**
DBMS support includes: IBM's DB2, Oracle, Ingres, Novell's NetWare/SQL, Gupta SQLBase

Progress Corp. Product: **Progress 4GL**
DBMS support includes: Oracle, Rdb, IBM's OS/400

PowerSoft Corp. Product: **PowerBuilder**
DBMS support includes: Oracle, Microsoft/Sybase SQL Server for OS/2, DB2, Informix, HP's Allbase/SQL

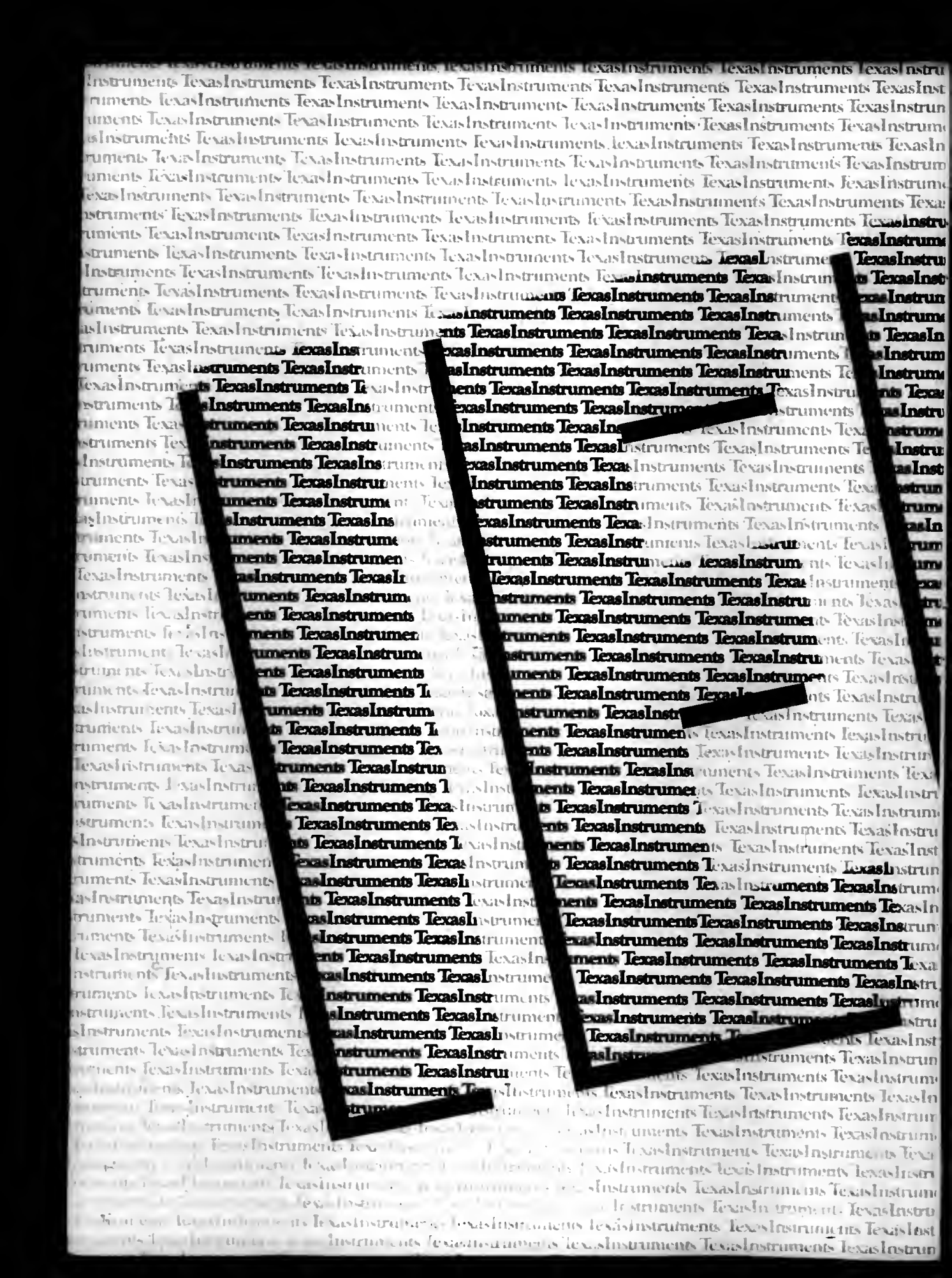
JYACC Inc. Product: **JAM**
DBMS support includes: Oracle, SQL Server for OS/2, Sybase, Informix, Ingres, Borland's InterBase, NetWare/SQL

Information Builders Inc. Product: **Focus**
DBMS support includes: Oracle, Sybase, Informix, IBM's DB2, Allbase/SQL

Cooperative Solutions, Inc. Product: **Ellipse**
Supports Sybase

Source: Companies

CW Chart: Janell Genovese


TexasInstruments

Now There's A Strong CASE For Managing Change.

Whether it's confronting the competition, facing legislative pressures or anticipating shifts in the marketplace, change is here to stay. To help you manage change is IEF™ CASE software from Texas Instruments.

The IEF is recognized as the leading tool for achieving integrated CASE solutions.

It offers a diverse portfolio of software that enables you to do everything from rebuilding high maintenance-cost systems to developing new enterprise-wide strategic systems. And with the IEF, you can do it more efficiently and with higher quality.

Among its many features, the IEF delivers truly integrated CASE toolsets and reusable application logic. This reduces the time and risk of application development, and thus provides a higher return on your investment.

In addition, developers can construct and maintain applications for multiple computing environments from a single business system specification without modifications. But when application changes are necessary, the IEF executes them at the diagram level, not code.

So, for the life of your system, specifications will always match the executing application.

Through it all, the IEF offers the ongoing training and support of software experts whose success is measured by yours.

Anticipating our customer's needs, we're delivering new and enhanced products this year that are enabling the IEF to support cooperative processing and the client/server application model. And with our strong research and development resources, you can depend on the IEF's continued leadership in integrated CASE technology.

Let us show you the best CASE for managing change. For more information, call us now at **1-800-527-3500**.

Government purchasers, please reference GSA #GS00K92AGS5530.

TEXAS INSTRUMENTS

IEF is a trademark of Texas Instruments Incorporated.

©1992 TI 76426

Independent tool sets catching on

CONTINUED FROM PAGE 87

the past two years, Drummond said.

While users gain freedom from their database vendors by buying independent tool sets, they may give up some performance. Each database has specific features, such as Sybase, Inc.'s remote procedure calls or Oracle Corp.'s triggers and stored procedures, that cannot be fully leveraged by some third-party tool sets.

"The problem is that they restrict the functionality that comes with each database," said Donald Feinberg, a software analyst at Gartner Group, Inc. in Stamford, Conn. Feinberg said such differences mean that the relational databases are not yet interchangeable commodity products.

But a new generation of tool-set products is coming, analysts said. Some vendors, such as Trifox, are embedding database-specific code generators to take advantage of proprietary RDBMS features.

Some are including C++ extensions that allow users to "glue" tool set applications to custom code. Users will then be able to fine-tune applications for better performance.

Hospital Corporation of America in Nashville would like to use such features to move toward distributed databases in its three-tier network of personal computers, NCR Corp. Towers and mainframes. The firm uses Information Builders, Inc.'s PC-Focus to write PC programs that extract data from IBM's DB2. "The promise of a distributed database is having intelligent applications knowing when and how to access databases on PCs and mainframes," said John Pair, development manager. "For us, at least, that's the future."

Some analysts said the independent tools are forcing a separation between the application development software layer and the underlying database engine.

American migration

OAKLAND, Calif. — American President Lines is a $2.3 billion global shipping company that has invested tens of millions of dollars in mainframe applications. Now, the firm is migrating to a distributed processing environment that pushes more of the computer work load into business units.

APL chose JYACC's JAM to develop client/server applications that run against IBM's DB2, Oracle 7 from Oracle and an NCR/Teradata database machine.

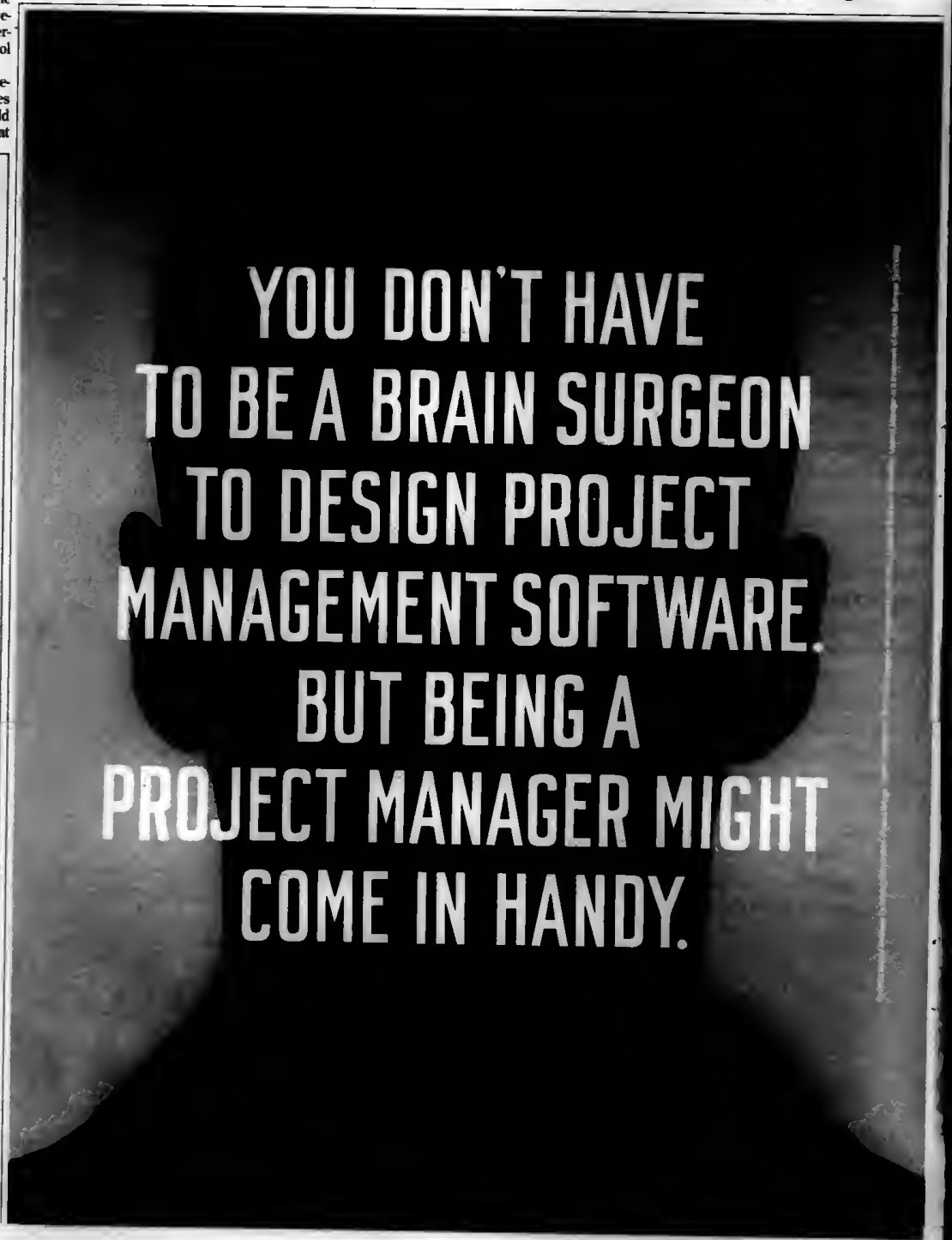
The 5,000-employee firm has 7,000 computers, including IBM PCs and Apple Computer, Inc. Macintoshes.

One client/server project, APL's transportation costing application, will access both DB2 and Oracle in 1993. "We had very few tools in our PC LAN environment and were using some CASE tools and Cobol to develop our mainframe applications," said Alex Gray, director of systems planning. "We wanted a tool that supported rapid application development and joint application development."

APL placed its own stamp on the tool set by plugging JAM and Information Builders, Inc.'s EDA/SQL "data warehouse" software into a homegrown "middleware" software layer.

"The middleware allows you to map your JAM variables to DB2," Gray explained.

The bond between the tools and the middleware, he said, will keep APL's client/server environment afloat.



ComputerVision to sell off Unix tools

VMark Software plans to buy rights to PI/Open for undisclosed sum

BY KIM S. NASH
CW STAFF

FRAMINGHAM, Mass. — ComputerVision Corp., the reincarnated version of Prime Computer, Inc., has agreed to sell rights to the Unix version of its database/application development system to a small Unix tools maker here.

VMark Software, Inc. plans to pay an undisclosed sum for PI/Open, which was designed to help users convert proprietary Prime minicomputer applications to a Unix environment.

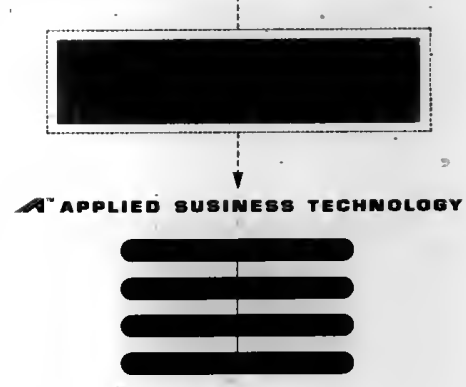
ComputerVision recently completed an initial public offering (IPO) of 25 million shares for $12 each on the New York Stock Exchange. Prime disclosed plans to spin off ComputerVision in June, hoping to raise $600 million to pay off some of its $1.29 billion debt.

Under the plan, Shearson Lehman Brothers, Inc. would receive $300 million in cash and $300 million in stock [CW, June 8]. However, the share price has dropped since the IPO, closing recently at $10.38.

PI/Open customers will be able to buy support contracts from ComputerVision, which will also resell the product for the length of the five-year agreement, a spokeswoman for the Bedford, Mass.-based company said. ComputerVision also plans to service VMark's UniVerse products. UniVerse is a similar proprietary-to-Unix conversion product.

At ABT, our software is designed from the unique perspective of a person who's been a project manager. So naturally it's easy to learn. Yet it handles the most complex and detailed projects comfortably, since we know from experience exactly what the job involves.

True, designing project management software isn't brain surgery. But it helps when you've been inside a project manager's head. Call 1-800-4-PROJEC.



Unix porting made easier

BY GARRY RAY
CW STAFF

Porting Unix applications across five versions of the operating system will be made easier with the Micro Focus Operating System Extensions Version 3.0.

The extensions work with Micro Focus, Inc.'s updated Micro Focus Cobol Version 3.0 for Unix, officials at the Palo Alto, Calif.-based company said. The updated compilers, tools and extensions support The Santa Cruz Operation's SCO Unix V3.2, Unix System V, Release 3 and 4, IBM's AIX V3 and OSF/1.

Designed to support client/server applications programming, the operating system extensions comprise two primary modules: the common communications interface (CCI) and a set of display routines that are portable across different hardware platforms and operating systems.

The CCI provides communication functions that allow programmers to use a single programming interface to develop network applications. CCI supports Transmission Control Protocol/Internet Protocol on Unix and other protocols including NetBIOS and Novell, Inc.'s IPX on DOS and OS/2.

CCI also works with Fileshare V2, a server-based file-handler that provides a number of the transaction-processing facilities needed by client/server applications, including data caching.

Besides the new CCI, Micro Focus has updated Cobol 3.0 for Unix with faster compilation speeds, enhancements to its editing and debugging tools and a preliminary release of its portable graphical user interface builder technology.

ATTENTION CONSULTANTS!
Increase your sales!
Advertise in Computerworld's annual Consultants Directory for just $399.
Appears in our Annual Forecast issue on Jan 4.
Ad Close: Dec 7
800-343-6474
x744

Multiply Your Client/Server Choices By 2.2

And multiply your productivity in the process. With APS 2.2, new from INTERSOLV.

APS 2.2 is the one cooperative processing tool that gives any desktop developer the most powerful tool of all: Choice.

The choice of how best to divide applications across IBM platforms. The choice of a user-friendly, intuitive GUI client that works with mainframe servers and existing applications. The choice of how much, or how little, outside support you need—APS 2.2 does not require a legion of expensive consultants to teach you how to use it. And the choice to change. Because with APS 2.2, you can quickly and easily regenerate your applications when new challenges and new choices arise.

APS 2.2 is fully customizable, completely flexible, and, most importantly, it works. To learn how easy it can be for your company to multiply choices, productivity, and profits by 2.2, just crunch these numbers:

1-800-777-8858, Ext. 123

1 800 777 8858, Ext. 123

(44) 727 812-812

NEW PRODUCTS

Application development tools

Folger Development Corp. has introduced Cobol Navigator 1.1, a Microsoft Corp. Windows-based tool.

The product was designed for Cobol source-code comprehension porting and maintenance, the company said. The ability to find program constructs such as program entry points, variable declarations, paragraph names and section names in multiple Cobol programs is enhanced with the product.

A Cobol parser is included, which screens the source code and makes hypertext links to program, variable paragraph and section name declarations.

Cobol Navigator runs on IBM-compatible personal computers and Windows 3.0 and above. The product costs $349.

Folger Development
Suite 262
801 W. El Camino Real
Mountain View, Calif. 94040
(415) 969-3191

Image Connection has released the Image Connection tool kit.

The product enables users with unmodified DOS programs to retrieve and display images from an image-processing system, the company reported.

The tool kit links complex host and DOS applications with a variety of document imaging systems. Image Connection runs on 640K-byte personal computers and requires the Microsoft Corp. C compiler.

The tool kit costs $995 for the bundled version and $895 for unbundled versions.

Image Connection
24241 Briones Drive
Laguna Niguel, Calif. 92656
(714) 831-8892

Computer-aided software engineering

Popkin Software & Systems, Inc. has released System Architect 2.4, a personal computer-based computer-aided software engineering tool.

According to the company, System Architect 2.4 features 14 enhancements including major data dictionary/encyclopedia improvements. A re-index feature increases the product's report generation speed and enhances response time on the networks.

System Architect 2.4 runs under both Microsoft Corp.'s Windows and IBM's OS/2 Presentation Manager.

The product costs $1,395 for a Windows stand-alone merger version and $2,940 for a Windows network version for two users.

Popkin Software & Systems
15th Floor
11 Park Place
New York, N.Y. 10007
(212) 571-3434

Code libraries

Innovative Data Solutions, Inc. has upgraded its Paragen code-generation system for the Paradox engine.

The product generates native language code with embedded calls to the Paradox engine, the company said. Standard Pascal, object-oriented Pascal, Pascal for Windows code and C and C++ can be created for accessing Paradox database applications.

Paragen code generator has an assortment of features including the ability to reduce hundreds of lines of hand-coded, low-level engine calls to a single function and session support for frequently used options.

The Paragen code-generation system is available in DOS and native Windows versions. The product costs $179.

Innovative Data Solutions
Suite 9
1757 Eastwood Court
Schaumburg, Ill. 60195
(708) 882-3713

Unix tool set removes Lint

BY GARRY RAY
CW STAFF

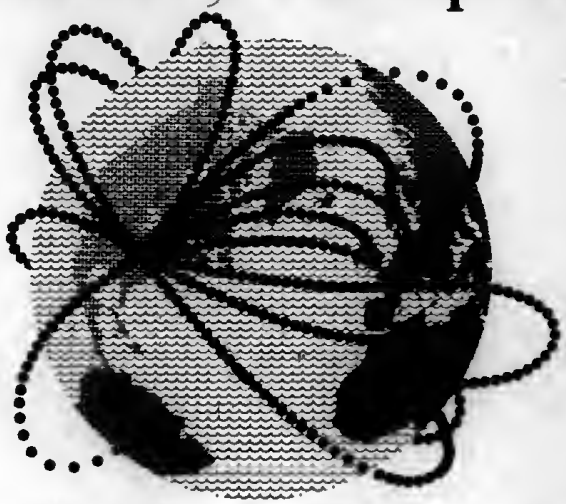
Unix programmers can remove Lint from their tool kits using a new coding aid by Procase Corp. in Santa Clara, Calif.

Called C/Spot/Run, the tool set includes a variety of graphical utilities that replace Unix programs such as Lint, Grep, Find and C Scope, company officials said. Those Unix programs provide syntax checking, text searches through one or more source-code files, file selection and cross-referencing. In addition, C/Spot/Run provides development utilities such as editing, filing and window management.

Because the programming tool kit is graphical, it provides separate windows for editing, syntax and semantics checking, error exceptions lists and function call graphs. The output and results from one window are available to other windows as needed. For example, errors found in a syntax-checking operation originating in the edit window are automatically sent to the exceptions window. By switching among these windows, programmers will be able to locate and repair errors more easily than with standard Unix utilities.

Designed to run on Sun Microsystems, Inc. SPARCstations with SunOS 4.0+, the tool kit is priced at $995.

If messages were parcels, we'd outdeliver Federal Express®.



Get global LAN e-mail connectivity through a local telephone call.

With your Novell NetWare® MHS-compatible system and our international network, you can exchange information with LANs and stand-alone PCs worldwide. Single messages to multiple destinations. Or many messages to one receiver. Automatically.

And if you call from most North American cities, or from many business centers in Europe, Japan, and Australia, you don't have to pay long-distance charges. When business takes you to more remote locations, the CompuServe Mail Hub is accessible through participating networks for less than you might think, 24 hours a day.

In addition to round-the-clock, round-the-world LAN-to-LAN express messaging, we also deliver to over a million CompuServe members. And with interconnections to Internet, fax machines, and other mail services, virtually no place on earth is beyond your reach.

So, remember...when you're sending e-mail messages, CompuServe delivers the world. If you're already a CompuServe member, GO MHS to get started. If you're not, what are you waiting for? Call 1 800 457-MAIL (6245) and ask for Operator 384.

Yes, please send me more information about the CompuServe Mail Hub!

Name _____
Company _____
Street _____
City _____ State _____ Country _____
Zip/Postal Code _____
Business Phone ( ) _____

Send coupon to: CompuServe
Dept. 384
P.O. Box 20212
Columbus, OH 43220

CW 9/14

CompuServe®

All names listed are proprietary trademarks of their respective corporations

Oracle 7: Stability and quality

Users may be excited about slew of new features, but its complexity may be somewhat daunting

Computerworld's New Product In-Site is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used with live application environments.

ORACLE CORP.'S ORACLE 7

- Beta-test users say Oracle has made great strides in improving the quality of its product, minimizing the reliability and installation problems that plagued prior versions. At the same time, Version 6 applications require minimal adjustments under Version 7.
- The users also report that the additional security and administrative functions are useful but could have been made much easier to use. They are also unhappy with the pricing, which requires additional purchases to receive distributed features.

Veterans of nightmarish Oracle upgrades rejoice! The vendor has licked its quality problems with the introduction of a beta-test version of its relational database management system that is more stable than the production version of previous releases, according to four corporate sites that evaluated the product for *Computerworld*'s New Product In-Site.

Oracle 7 brings a slew of new features and functions to users — making it competitive with longtime leading-edge companies such as Sybase — in a package that retains the form and fit of Oracle 6 but avoids the reliability hassles.

Currently in its final beta stages, the system is expected to be released in a production version within the next few months. Oracle has taken pains to improve the quality of its production release, its first major upgrade since 1989.

But these accomplishments come with a price: Version 7 is much more complex from the database administrator's point of view. There is also a significant learning curve for information systems staff members used to a simpler Oracle product, the evaluators said.

"Oracle users haven't had this kind of complexity and flexibility before," said analyst David McGoveran at Alternative Technologies.

"The additional tool functionality and stored procedures may be a boon, but previous Oracle users should move cautiously. They may be both excited and overwhelmed," he said.

The evaluators said they were taking advantage of the following new features of Oracle 7:

- Parallel server capability.
- Stored procedures — programs stored directly in the database that can perform repetitive functions for all applications that access the server.
- Triggers — program routines that alert users when special conditions exist.
- Declarative referential integrity — functions that allow developers to set data management and business rules when they create database tables.

Installation descriptions for companies that evaluated Oracle 7

	Manufacturer	Utility	Insurance	Petroleum
Hardware platform	VAX 8800	NCR 3550	Range of VAXs	VAX 6420, RS/6000-550
Version in use now	7.0.9	7.0.9	7.0.10	7.0.10
Time installed	3 months	1 month	1 year	1 year
Using previous version	Yes	Yes	Yes	Yes
Applications type	OLTP	OLTP/test	OLTP	OLTP
Number of applications	3	1	1	1
Number of users	2-20	3-5	10	5
Transaction rate	Low	Low	High	High
Update or read intensity	Record inserting	Good mix	50/50	Record inserting

METHODOLOGY: Product ratings are based on evaluations from four user sites (profiled above). These are beta-test users of Oracle 7, which is due to be released in a final production version within the next few months. The users are members of Computerworld's Product Evaluation Council.

EASE OF INSTALLATION

According to evaluators, installation ranged from comparable with Version 6 to much easier. One of the main reasons for the difference was that two of the companies had Oracle technical consultants on site as part of an "alliance program" with the Redwood Shores, Calif., software vendor.

The program involves 14 beta-test sites that agreed to share evaluation and implementation information with Oracle in exchange for technical support and quick access to Oracle 7 developers, technicians and support staff.

Three of the four companies installed their systems on Digital Equipment Corp. VAX platforms under VMS, which is the first priority platform for Oracle.

The utility company installed the product on an NCR Corp. NCR 3550 under Unix V, Release 4.

The petroleum company installed the product on an IBM RISC System/6000, Model 550, as well as a VAX 6420.

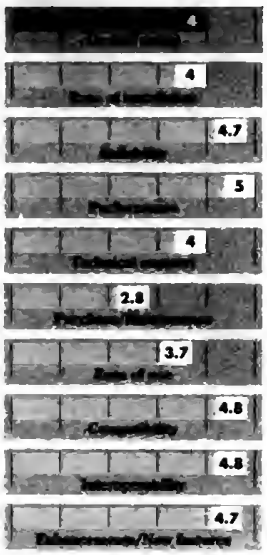
Utility evaluator: "The 'make file' command wouldn't work, so we had to install each part of the product separately. It took several calls to the vendor and about 20 hours to figure out what was going on."

Insurance evaluator: "It was much easier than anticipated to load both the alpha and beta copies. We saved it all on disks first and loaded it off the disk because it goes much faster. It took about two hours."

Petroleum evaluator: "Installation was a breeze. It was no different than what I'd done before. Oracle made sure we had the help we needed to get the installation done." He also said the installation could take under three hours if users off-load the program tapes to disk and install from the disk.

Oracle Corp.'s Oracle 7

Ratings are based on user expectations on a scale of 1 to 5, where 1 is below expectations and 5 is above expectations. Ratings are presented in order of importance to users.



RELIABILITY

The evaluators found the system to be more reliable than they expected. No serious failures were reported.

"They have apparently taken the time to go through modular testing and integration testing a little more carefully," McGoveran said.

"With Version 6, the developers were under a lot of pressure just to get the product delivered in whatever shape. That's not true anymore. Oracle made a pretty tough decision to slow things down a little bit," he added.

Manufacturing evaluator: "We haven't found anything that was serious enough to bring [Oracle 7] down."

Insurance evaluator: "The initial version didn't have all of the features in it. But as they were delivered, they were very high in quality."

Petroleum evaluator: "I was prepared to have the same kind of [installation] problems I had years ago, and I didn't have any of them.

"One reason for that is that going

from Version 5 to Version 6 meant recreating the database. Going from Version 6 to Version 7, you don't have to do that."

PERFORMANCE

The insurance evaluator found his online transaction processing application ran 25% faster than it did with Version 6. The application is accessed by 10 users with a high transaction rate and a fifty-fifty mix of update and read activity. The platforms are made up of a variety of VAXs, including a VAX 3800 and 4200.

According to the Transaction Processing Performance Council (TPC), Version 7 has achieved TPC-B benchmarks ranging from 107 to 618 transactions per second at a cost of $11,006 to $12,604 per transaction per second.

The evaluators expect significant performance increases once the production version of the product is in their hands. New features such as triggers will allow performance boosts because they cut down on the number of transactions.

Insurance evaluator: "Oracle conversions usually have been functionality first, and then performance comes near the end, when they get closer to production."

TECHNICAL SUPPORT

Support responsiveness ranged from a three-week delay in pinning down an answer to Oracle support personnel calling the alliance members to ask if they had problems.

In all cases the evaluators felt Oracle was responsive, but the manufacturer found there were things he already knew about the product that came as news to the technicians.

The utility evaluator and manufacturer found a greater need for support because they were working with Version 7.0.9 rather than 7.0.10, which fixed some of their concerns.

PURCHASE/MAINTENANCE

Oracle's new pay-as-you-use pricing scheme, which was designed to match competitors' offerings, made the acquisition of Version 7 more expensive for the evaluators. Users must pay separate fees for the parallel server, procedural database and distributed database options.

Insurance evaluator: "We have over 40 licenses now, and it's going to be more expensive than I thought to go from Version 6 to 7. I thought more would be included. I was a little surprised at the pricing."

The evaluators said maintenance costs are higher on the database administration side than for Version 6 because of the wealth of tuning parameters and options added to Oracle 7. Costs are generally lower on the application development side.

Manufacturer: "The number of parameters associated with tuning has gone up, so maintenance and new releases will take more time. There will be less application development work because they have made the environment a little better integrated."

Petroleum evaluator: "I was not surprised that it was going to cost more. I don't view it as a problem. Our contract covers all the functionality."

EASE OF USE

Beware of the learning curve, the evaluators said. Database staff members can expect more difficulty in administering Version 7 than previous versions, largely because of the many added features. However, the evaluators said not all of these options will be needed for every application, and some of the learning curve involves knowing what options *not* to use.

Manufacturer: "There's a lot more for the [database administrator] to know. There's a learning curve that you've got to get up and get over."

Utility evaluator: "It's going to be harder to administer. I'm still running into problems with the security and ID administration aspects. It was much simpler in the prior version."

Petroleum evaluator: "From a database administration standpoint, it's much, much better. Although it is enormously more complex, at the same time [Oracle] has left all of the simplicity from Version 6 in there. You don't need to use a lot of the features if you don't want to."

COMPATIBILITY

Conversions of applications from Version 6 to Version 7 have been very smooth, the evaluators said. Most are running Version 6 applications unaltered under Oracle 7. None had yet updated these older applications to use any significant number of the new Oracle 7 features.

Insurance evaluator: "We can run Version 6 applications against Version 7 databases without changing them. The only work is making changes to accommodate the new features in Version 7."

Petroleum evaluator: "I've imported data into it and haven't seen any problems, nor do I expect to."

INTEROPERABILITY

The evaluators reported smooth interoperability. The manufacturer found no problems communicating between a VAX running Version 7 and a Sun Microsystems, Inc. system running Version 6.

The petroleum evaluator reported no problems using a VAX and an IBM RISC System/6000 as servers with clients on a number of different platforms.

Petroleum evaluator: "It did what I wanted it to."

The manufacturer said applications developed on Sun workstations using Oracle's Forms 3.0, Menu 5.0 and Report Writer 1.1 ran without difficulty on Oracle 7.

ENHANCEMENTS/NEW FEATURES

The evaluators also said the new features are providing the benefits they expected. They look for more features and functions in the production release of the product, including faster performance.

The most popular features are improved security, referential integrity, stored procedures and triggers.

The utility evaluator found the security enhancements were not as easy to use as expected.

The petroleum evaluator found the alliance process enabled him to get the enhancements that he needed added to early versions of the product.

Manufacturer: "The features that we were expecting — parallel server technology and stored procedures — are present."

Utility evaluator: "Triggers and declarative integrity might be the most popular here. We're kind of big in total integrity."

Insurance evaluator: "It had many more features than we were expecting."

Petroleum evaluator: During our testing, "we found that there were little things that we needed, such as information from other databases. We asked for enhancements to the product, which were made. They added things at our request.

"Version 7, to my way of thinking, you could really call Version 6.3. It's a lot on new features, but a lot of what's underneath is still the same."

Reported by Michael L. Sullivan-Trainor and Garry Ray.

Transaction Processing Performance Council Ratings

	TPC-B throughput	Price/ Performance	Platform
Oracle 7	618.9	$11,006	Sequent S2000
Oracle 7	578	$11,606	HP 9000-890
Oracle 7	107.28	$12,604	Sun SPARCserver
Informix On-Line 5	110.42	$9,866	HP 9000-877S
Oracle 6	48	$20,928	IBM RS/6000-950

ORACLE RESPONDS

Oracle's Tim Negris, senior director of corporate strategy, responded to the issues raised in this report.

Improvements in the quality of Oracle 7: We have done rigorous testing of the product, including an alliance partner program of 14 very large users; a developer's release, which has been flowing out during the past five months; and a formal beta-testing program with 100 customers on a variety of platforms. Customers are exercising different parts of the product with different kinds of applications and have been reporting on their progress, both positive and negative.

Complexity of Oracle 7: In reality Oracle 7 is simpler to use rather than more complicated. But because of the scale and scope of enterprise computing, it's necessary to provide choice. When users get experience, they discover that the number of options they need to tune is actually quite limited. Different people use different subsets of functionality in service of their applications.

Pricing changes: We've divided the modules of Oracle 7 to allow customers to buy and maintain only the portions of the product that they need. Customers can get more functionality for less money than they would have spent on Oracle 6 on comparable platforms. Because of product improvements, users can downsize their hardware platforms and move to a lower priced licensing category.

Platform support: We recognize that our customers live in a heterogeneous world, and it is harder to use the new features on one platform if they don't have the same features on every platform. So we have worked hard with Oracle 7 to compress the porting cycle to as minimal a time frame as is possible.

Future upgrades: This release will take users very far into the future because of the expanded base functionality of the product. We are in the process of parallelizing our query processing and optimization facilities for loosely coupled systems for an intermediate release. With regard to Oracle 8, we are focusing on large database support and incorporating objects into our implementation of the relational model. We're making good progress. We'll be able to turn things around much more quickly.

COMPUTERWORLD PRODUCT EVALUATION COUNCIL

AT&T • American President Cos. • Bell Atlantic Corp. • Bell Canada • Bergen Brunswig Corp. • The Chase Manhattan Bank NA • Commonwealth Edison Co. • Consolidated Freightways, Inc. • Constitution Financial Corp. • Dresser Industries, Inc. • Federal Express Corp. • First National Bank of Chicago • FMC Corp. • Grumman Corp. • ITT Corp. • Kmart Corp. • Long Island Lighting Co. • Mandrake, Inc. • Massachusetts Mutual Life Insurance Co. • MCI Communications Corp. • Mellon Bank Corp. • Metropolitan Life Insurance Co. • Northeast Utilities • Preston Trucking Co. • Primerica Corp. • Public Service Electric & Gas Co. • Ryder System, Inc. • Sherwin-Arnaugh • The Aetna Group • The Southern Co. • University of Michigan • University of Virginia

Network tall buildings in a single bound.

With Chipcom's ONline™ System Concentrator you can connect a tall building or a far-flung campus with a seamless, unified and totally reliable network. A network that is truly self-healing, and capable of surviving multiple faults, from broken cable to failed modules or power supplies.

The ONline Concentrator is an intelligent wiring hub that handles all media, including coax, fiber and twisted pair. Its TriChannel™ architecture lets you configure up to three networks on each hub in any combination of Ethernet, Token Ring and FDDI.

Other network management systems merely allow you to perform an autopsy after your network has died. Chipcom's new Network Control System does much more: It provides instant CPR to keep your network alive by automatically rerouting itself around a failed component. And it lets you reassign, balance and reconfigure without setting foot in a wiring closet.

Using Chipcom's ONline System Concentrator as your network platform, you can build a network with the reliability, flexibility and manageability necessary to take it into the 21st Century.

And just think what a super hero that will make you.

BECOME A HERO.

Learn how to conquer the major causes of network failures. For your free copy call 1-800-228-9930.

GSA# GSOOK90AGS5185

NETWORK RELIABILITY

CHIPCOM™

ONline and TriChannel are trademarks of Chipcom Corporation

© 1991 Chipcom Corporation Southborough Office Park, 118 Turnpike Road, Southborough MA 01772

PAIN & Pleasure

COMPUTERWORLD 1992 JOB SATISFACTION SURVEY

The hours are longer, the work load is growing and stress runs rampant. Yet many like their jobs more than ever. Are IS people crazy?

BY ALAN RADDING

Not that you need to be reminded . . . but these are trying times for information systems professionals. A stubborn, nasty recession continues to take big bites from technology budgets, forcing IS shops to struggle through a second or third year of doing more work with fewer resources.

"We have to take our fair share of across-the-board reductions," says Hal Eckel, director of information services at Haworth, Inc., a Holland, Mich., maker of office furnishings. "Other departments are rushing to us for support to help them cope with their cutbacks. We're seeing geometric increases in the demand."

These days, more work and less money is the rule, according to *Computerworld*'s Sixth Annual Job Satisfaction Survey. Some 60% of the 770 IS senior- and midlevel managers and IS professionals in large organizations say their work loads (and stress) have risen during the past year, especially at the lower levels (see chart page 101).

Given that backdrop, it's hardly a surprise that the number of respondents who considered their jobs "very unsatisfying" or "somewhat unsatisfying" rose 6% this year.

But wait a moment. Beyond the long hours, shrinking (or vanished) bonuses, training cutbacks and meager hopes for advancement, there's also growing satisfaction.

It's true: Despite the double-whammy of downsizing resources while upsizing expectations, the number of IS people who say they are "very satisfied" or "somewhat satisfied" with their jobs climbed 8% this year.

In addition, more than one-third of all polled and nearly half of senior executives report increased satisfaction in comparison with the 1991 survey.

Does this prove once and for all that you have to be crazy to pursue a career in IS? Maybe, but not necessarily. Some people seem to thrive under difficult conditions and heavier burdens.

"There's a lot more stress and pressure, for sure," says the senior IS manager at a major insurance company in the Midwest. "But that's what I find challenging, and I like it."

Despite edicts to cut spending and freeze hiring, this IS chief has embraced the challenge of boosting productivity and motivation. For example, in a switch of conventional practice, he hired consultants to temporarily take over routine maintenance. In-house staff members were thus freed up to tackle an exciting new development project.

"It gave our people a big boost," the executive reports.

Indeed, many IS pros report feeling energized by adversity (see profiles page 100). In the current do-more-with-less times, IS pros are managing to find other strong motivators, too.

Predictably, pay raises remain a favorite incentive and path to satisfaction. But a hearty pat on the back and an enthusiastic "well done" are much appreciated, too, especially by senior managers.

All told, a surprising 85% of respondents say that happiness in one's job matters more than career advancement. Things such as sense of accomplishment, enjoyment of work, sense of worth and yes, money, are more important, they say, than simply getting ahead.

Nearly half of IS professionals held this view, compared to 35% of middle managers and 22% of senior managers.

All's not rosy, however. Several ominous signs indicate there's reason to fear that things might be corroding deeper in the IS organization. Consider the following:

- **Departmental satisfaction is down.** In contrast to their own rosy personal assessments, 30% of all the respondents said they believed satisfaction in their department as a whole was eroding, compared to 26% last year. Nearly 35% of the nonmanagers noted a decline — twice the rate cited by management.

Continued on page 100

- Heavier work loads and higher stress levels are reported by nearly two-thirds of respondents.
- Satisfaction tends to drop lower in the ranks.
- Three out of every four say they would welcome a job change.

Richard Abraham

Haworth's Eckel: *'We're seeing geometric increases in the demand' for IS*

Radding is a free-lance writer based in Newton, Mass.

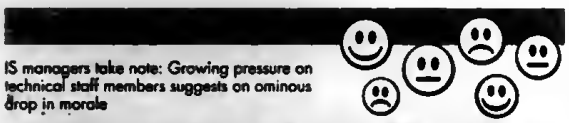
Grins, grimaces and grit

Numbers alone don't tell the entire job satisfaction story. Experiences of information systems professionals vary as much as different positions, companies and people themselves. *Computerworld* recently spoke with a cross-section of IS managers and staff members to get a close-up look at life in today's IS trenches. Some are struggling; some are coping. Others are even thriving. Free-lance writer Alan Radding reports.

▶Yearning for change

"IS is interesting when it is changing," says Bill Knobles, MIS manager at the Omni Inner Harbor Hotel in Baltimore. In past years, new technology and development have fueled that change.

Unfortunately, new initiatives were an early casualty of the recession. Today, many organizations are sticking with older systems and applications, especially in the hard-hit hospitality industry.



IS managers take note: Growing pressure on technical staff members suggests an ominous drop in morale

	Overall average	Senior executive	Middle manager	Nonmanager
Improving	18.8%	28.3%	21.0%	10.2%
Stable	51.5%	52.2%	49.8%	55.3%
Declining	29.7%	19.5%	29.2%	34.5%

"We've been cutting back for two years," Knobles says. "We have less people, and we're not updating the equipment.

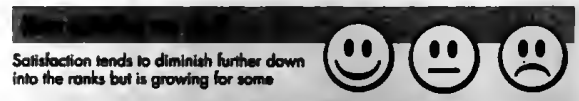
"Pay raises are modest. And there is little room for advancement in a shrinking shop," he adds.

To keep himself and his two-person staff motivated, Knobles has tried several tactics, including rotating staff assignments. He's also fought and won funding so that he and his staff can learn new skills.

"We just finished a three-day program," he says.

Without opportunities like these, he says, IS staff members get bored, morale drops and productivity suffers. He is eager for new and interesting challenges.

"I've been on the same minicomputers now for five years, counting a previous hotel IS job," Knobles says. "I really want to learn new things."



Satisfaction tends to diminish further down into the ranks but is growing for some

	Overall average	Senior executive	Middle manager	Nonmanager
Very satisfied		39.4%	27.5%	24.0%
Somewhat satisfied		45.7%	48.8%	46.3%
Neutral		2.1%	6.3%	6.6%
Somewhat dissatisfied		8.5%	10.8%	16.6%
Very dissatisfied		4.3%	6.6%	6.5%

Increased satisfaction	Decreased satisfaction	Same as last year
37.2%	29.4%	33.4%

▶Double time, double trouble

Mike Graeber has been working flat-out, and he's getting tired.

Although officially the systems administrator at Staco Energy Products Co., a manufacturer based in Dayton, Ohio, he is also de facto IS manager at both Staco and a struggling sister company. "I'm trying to do two full-time jobs without having to put in 100-hour weeks," Graeber says.

Much of the crunch stems from work involved in consolidating the sister company onto Staco's minicomputer as part of a company drive to slash costs. Though Graeber says he has enough staff support, he still must spend nearly one-third of his time traveling.

He accepts that the weak economy has decimated Staco's profit-based bonus plan and that he'll probably have to work nonstop until the minicomputer consolidation is completed this fall.

But what really bothers him? Graeber says it's the pressure that has kept him from exploring other, possibly more satisfying, career challenges.

"I'd like to start playing with PCs again and looking at new technology," he says. Sadly, that's not likely right now.

No wonder that at times like this Graeber says he sometimes questions his long-term commitment to IS.

"I don't see myself becoming the vice president of MIS at some large manufacturing company," he says. He muses about returning to graduate school.

However, there'a little time to weigh options. "My boss has another project waiting when we finish this. I don't know what it is, but at least it will be different."

▶Wanted: Grace under pressure

Pressure can bring out the best in some people. So believes Charles Bedekovich, data processing manager at Pittsburgh-based Employee Benefit Claims, Inc.

Pain & pleasure

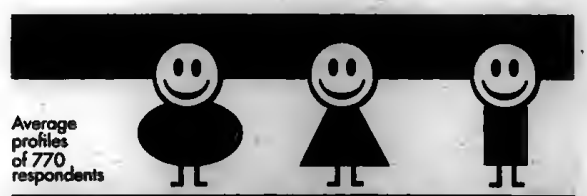
CONTINUED FROM PAGE 99

- **Few believe that IS is being used to its fullest potential.** Some 68% of all the respondents say they believe that they are not "working up to their fullest potential." The feeling is even stronger among nonmanagers (72%).
- **IS performance is seen as declining.** Some 15% of those polled described IS performance as "declining" vs. 12% the previous year. Again, criticism was harsher at the lower levels, with 21% of nonmanagers reporting a drop. In contrast, 53% of senior managers saw an *increase* in their job performance.
- **Many are looking for new jobs.** Although the hiring market is pretty dismal in most places and many respondents say they are satisfied, more than 75% of those polled say they would welcome a job change. Twenty percent are actively looking for new work. Among nonmanagers, those who said they would switch jobs rises to nearly 83%.

Unhappy at the bottom

Overall, the responses suggest that satisfaction is lower and criticism stronger at the middle management and professional levels. This is probably because of staffing cutbacks and work load pressures, the brunt of which has been borne by lower level workers.

What to do? According to respondents, flexible job scheduling, more bonuses, better training, more opportunities for advancement, better salaries, the opportunity to telecommute and more feedback from supervisors could all help improve satisfaction. •



Average profiles of 770 respondents

	CIO, VP/ manager of IS services	Director of IS, technical manager	Programmer/Analyst, systems developer
Direct reports	24	11	2
Years at current job	9.7	10	6.6
Years in IS	17.9	16.4	11
Age	45	42	36
Department size	189	226	379
Sex	96.8% male 3.2% female	85.1% male 14.9% female	75.5% male 24.5% female

IT PRINTS UP TO 20 PAGES PER MINUTE.

IT ADJUSTS FROM ONE LANGUAGE TO ANOTHER-AUTOMATICALLY.

IT PRINTS IN EVERY CONCEIVABLE SIZE.

IT HOLDS UP TO 1,500 SHEETS OF PAPER.

IT REDEFINES WHAT A NETWORK PRINTER CAN DO.

IF IT DID ANY MORE,

The new COMPAQ PAGEMARQ 20 and COMPAQ PAGEMARQ 15. Two network laser printers that will immediately establish the industry benchmark. Printers for those who want nothing short of everything.

After rather extensive R&D, we realized the average network printer was doing more to raise your network's blood pressure than its productivity level.

Which led us to more extensive R&D and two breakthroughs: two network laser printers which are bristling with features designed to help everyone work in harmony.

For starters, COMPAQ-built, RISC-based controllers, along with powerful print engines, run our printers at 15 and 20 PPM. And at 20 PPM, that's an average of 100% faster than HP IIIsi in PostScript applications. Which helps keep your network's output more than up to speed.

Then there's the ability to print in sizes up to 11" by 17". Which can really make your day if it's filled with everything ranging from envelopes to double-page layouts to CAD plots to spreadsheets.

The built-in motorized paper trays can hold up to 1,500 sheets, more than any other desktop printers. Allowing you to put your time to far better uses than loading paper.

To Compaq engineers it simply wasn't enough for our printers to understand both PostScript Level 2 and PCL 5. Therefore, unlike other printers, ours have an Intelligent Emulation

YOU'D BE OUT OF A JOB.

Sensing feature that continually monitors, with radar-like precision, the language which anyone is using at any moment. It will then automatically adjust to that emulation, without your lifting a finger.

A truly network-ready printer should meet all of your network needs. This is why our new COMPAQ PAGEMARQ Laser Printers provide a direct connect to both Novell and AppleTalk environments, without the need for a print server.

The printers also offer you five interfaces, so that you can simultaneously run Ethernet or Token Ring, AppleTalk, both a serial and a parallel port, and even an Internal FAX Modem. Which will lead to better communication across the entire network. Rather than the kind of language that best remains unprinted.

Completing the picture is the 800 x 400 COMPAQ High-Resolution Print Mode, created to give you exceptionally crisp text and graphics.

Both the Programmable Font Modules and internal 60-MB Hard Drive let you store PostScript fonts permanently, without having to constantly download.

Thus, what you've got amounts to far more than merely a network printer.

You have the brainchild of a company which holds the belief that utter chaos does not have to be standard operating procedure in your network.

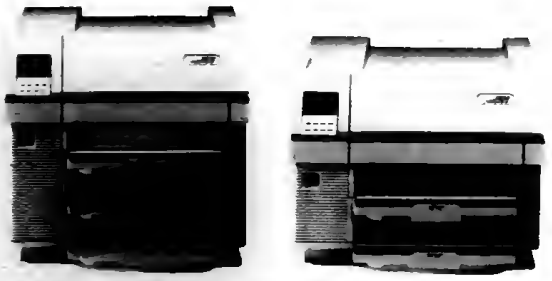
For more on COMPAQ PAGEMARQ printers, just turn to the next page.

They print in sizes up to 11" by 17." They can handle CAD images, spreadsheets, and even double-page layouts. Multiple Twin-Trays hold up to 1,500 sheets. Impressed?

Our Intelligent Emulation Sensing feature continuolly monitors, then automatically adjusts to either PostScript Level 2 or PCL 5 depending upon which language you're using. You needn't lift a finger.

COMPAQ

THOSE WERE THE BROADSTROKES. NOW HERE'S THE FINE PRINT.



COMPAQ PAGEMARQ 20: *20 PPM ◆ 20-MHz AMD 29000 RISC w/128-K cache ◆ 4MB RAM standard, expandable to 20MB ◆ 1,500-sheet (standard)*

COMPAQ PAGEMARQ 15: *15 PPM ◆ 16-MHz AMD 29000 RISC ◆ 4MB RAM standard, expandable to 18MB ◆ 750-sheet (standard), 1,000-sheet max w/ optional second TwinTray*

BOTH MODELS: *Up to 800 x 400dpi (COMPAQ High-Resolution Mode) ◆ PostScript Level 2 and PCL 5 w/Intelligent Emulation Sensing ◆ One slot/port each for AppleTalk, Network Interface Cards, Internal FAX Modem, Serial and Parallel Port ◆ Available Options: Internal 60-MB Hard Drive, 1- and 2-MB Programmable Font Modules ◆ Consumables: One-piece cartridge w/12,000-page yield*

At Compaq, we realize even the most advanced network printers in the world aren't worth the toner in their cartridge kits if you can't get the service or the parts that you need whenever you need them.

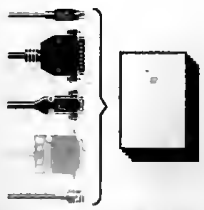
Thus we've designed CompaqCare. This is our comprehensive service and support program which includes our one-year free on-site* limited warranty.

It will also provide you with, among other things, repair of your printer by the second business day, anywhere in the U.S.

Whenever you need consumables, you can buy them at all participating office supply stores, at our more than 3,000 Authorized COMPAQ Reseller locations, or right from us.

For any questions, or to learn more about our new program for recycling consumables, phone our hotline at 1-800-345-1518 in the U.S.; in Canada, call 1-800-263-5868.

You'll find dedicated printer specialists eager to convince you that the path to greater network productivity begins not only within yourself, but along the paper path that is inside your COMPAQ PAGEMARQ Laser Printer.



Five interfaces, with a direct connect to Novell and AppleTalk, lets you simultaneously run Token Ring or Ethernet, AppleTalk, a serial and parallel port, plus an Internal FAX Modem.

Store PostScript fonts forever. Expand your font library. And eliminate constant downloading with Programmable Font Modules or the internal 60-MB Hard Drive.

With our printers' optional Internal FAX Modem, you can send and receive presentation-quality documents, in sizes up to 11" by 17". Right from your desktop.

COMPAQ

*This service is provided by guaranteed service providers, and may not be available in certain geographic locations. © 1992 Compaq Computer Corporation. All rights reserved. COMPAQ registered U.S. Patent and Trademark Office. PAGEMARQ and CompaqCare are trademarks of Compaq Computer Corporation. Product names mentioned herein may be trademarks and/or registered trademarks of their respective companies.

More people say they feel more squeezed. Top bosses are pressured by growing work loads, more demanding business units and the effects of recession. Middle managers worry about losing their jobs. Growing work demands stress out IS pros.

	Senior executive	Middle manager	Nonmanager
More	51.1%	57.8%	65.9%
Same	33.7%	31.8%	29.3%
Less	15.2%	10.4%	10.3%

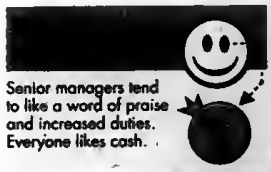
Increased work load	[illegible]
Increased demands from business	[illegible]
Concern about job loss	[illegible]
Budgetary constraints	37.5%
Overall economy/recession	20.1%

"Top people seem to prefer to work under pressure. They like to be challenged," he says.

The company is doing well, and Bedekovich is on the prowl for top people to strengthen his IS team. "We're improving the quality of our people and weeding out nonperformers," he explains.

A realist, Bedekovich tries to keep his IS organization focused on attainable goals and objectives. "You're always going to have people who have bad days," he says.

To motivate his staff, Bedekovich draws from a bag of motivational techniques, none of which involve money. Some employees he pressures; others are challenged by new problems. Still others receive a little tender loving care. Bedekovich explains: "They want some attention. They want to know that I'm interested."



Senior managers tend to like a word of praise and increased duties. Everyone likes cash.

Salary increase	35.6%
Promotion	14.5%
Personal congratulations	13.8%
Bonuses	11.3%
Public recognition	11.3%
Increased responsibilities	11.3%
Other	2.2%

True, the pressure is intense, but Bedekovich believes it's still fun to work in a growing, profitable business. "Most of the people here," he reports, "are very enthusiastic."

▶Washington's Santa Claus

"Sure, there is quite a bit of stress," says Larry Barker, director of computer services for the county of Klickitat in Glendale, Wash. "But people in IS don't know what stress is."

Barker isn't just macho posturing.

Before switching careers into computers, Barker worked as a juvenile probation officer. "Now that'a a stressful job!" he exclaims.

Sure, the rotten economy has created extra pressures for technology professionals, he says. But compared with some other fields, things could be a lot worse, he says.

For example, despite the major, widespread problems of local and county governments, Barker has the full financial backing of his Pacific Northwest county.

County officials "recognized that they have to get on the IS bandwagon and spend some money," Barker says.

True, Barker puts in long hours, as users pile on demands. But he says the reward is high.

"This is more enjoyable every day because of the feelings of accomplishment," he says, noting that many county departments have never had a computer. "People call me Santa Claus. That makes me feel great."

'This is more enjoyable every day,' *county of Klickitat's Barker says, pictured by a local re-creation of Stonehenge dedicated to World War II veterans. 'People call me Santa Claus'*

▶On track (with smaller boots)

Downsizing computer systems, staff and a dramatic corporate overhaul are giant pebbles in the boot of Nocona Boot Co., a Western footwear manufacturer. In a staff-cutting move, the Nocona, Texas, company recently moved from a proprietary NCR Corp. mainframe system to an IBM Unix system.

"Morale is high for the moment because we've got new technology to play with," says John Wicker, director of IS.

But darker times loom ahead for IS and the rest of the company. More staff cuts are likely.

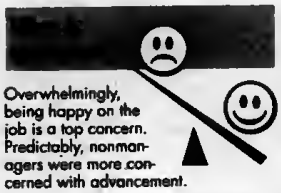
And Nocona management expects other problems to arise, as workers struggle with dramatic changes wrought by streamlining the 65-year-old company.

To ease the pain, all 450 employees are participating in a special training program designed to ease the shift from a traditionally structured manufacturing company to a modular, more open structure. Despite some initial suspicion, Wicker says that many people are now getting excited. Still, he concedes that IS productivity has suffered from the many organizational and technical changes.

Take downsizing, for example. "When you leave the mainframe," Wicker notes, "you don't find the same productivity tools."

At the same time, the IS department

Continued on page 104

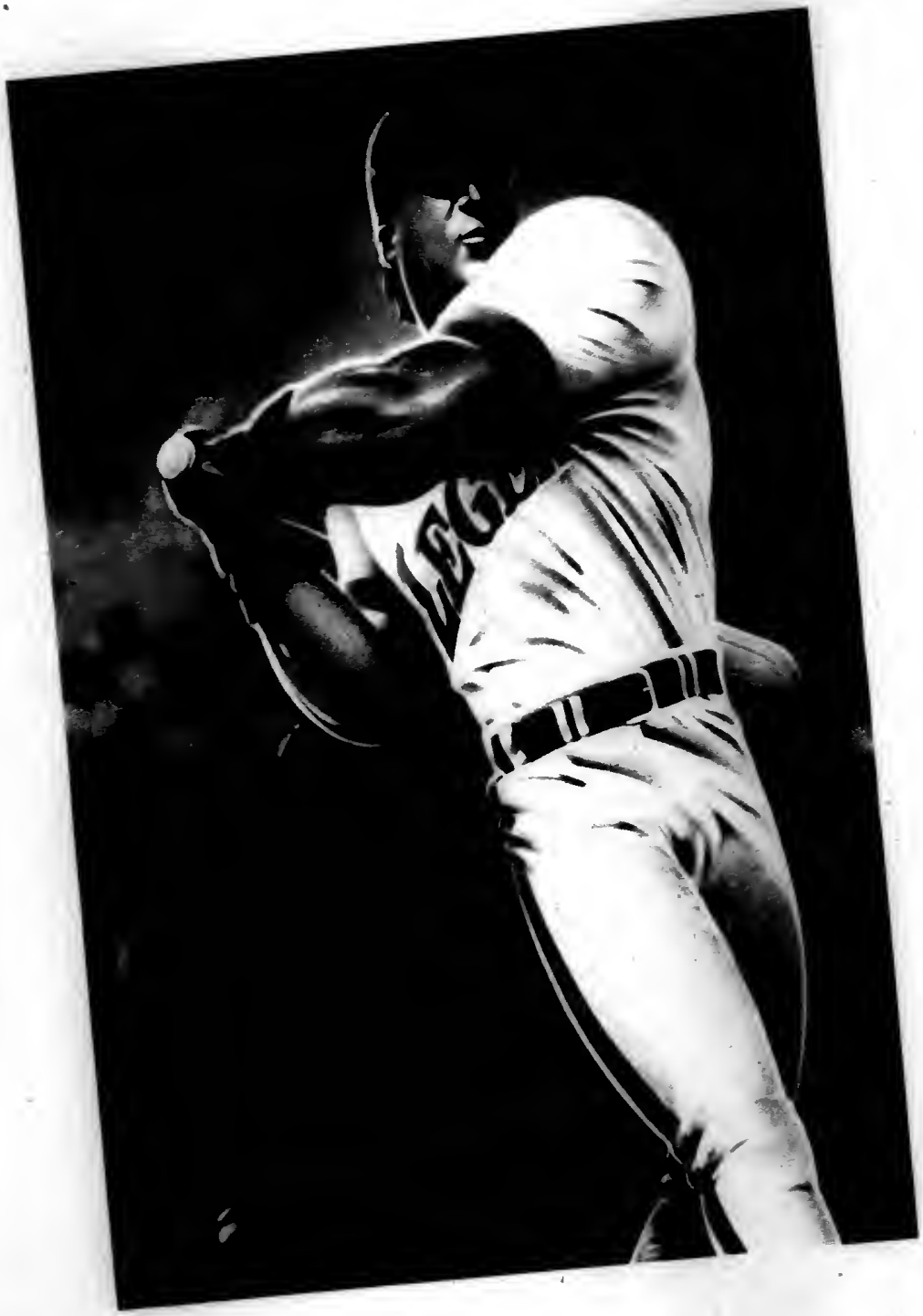


Overwhelmingly, being happy on the job is a top concern. Predictably, nonmanagers were more concerned with advancement.

Job satisfaction	[illegible]
Career advancement	14.5%
Both	1.3%

Enjoy work, money, accomplishments	[illegible]
Helps company, others	[illegible]
Leads to career advancement	10.7%
Close to retirement	8.1%
Better family life/ quality of life	4.5%

Omni Inner Harbor Hotel's Knobles *rotates staff assignments and encourages new training to boost morale and keep staff members from getting bored*



IN SYSTEMS MANAGEMENT, IT'S A WHOLE NEW BALL GAME.

The recent joining together of Legent and Goal has done more than create a new, larger company.

It's changed the entire playing field of systems management.

Not because the new Legent is a bigger company than before.

But because we're going to be the one that's best to do business with.

Both Legent and Goal have always been responsive to our customers' needs, with business practices recognized as the fairest in the industry. We intend to continue that tradition.

Both of us have always ranked at the top in customer service. We're going to stay there.

We've always offered outstanding technologies. Now, our combined product lines deliver an unparalleled range of solutions. And together, we're forging an exciting new strategy to allow organizations to expand systems management across the entire enterprise.

The new Legent has nearly doubled in size. That means you'll be dealing with a company with the strength to guarantee that we'll be here to service you in the years to come.

But our new strength is more than just size. The dedication, quality, and commitment to excellence that characterized the people of both Goal and Legent are what attracted us to each other in the first place. So even though we're a new team, we're taking to the field with the same game plan both of us have always played by.

If you're an IS professional, we think you'll be interested in knowing more about Legent.

Call us at **1-800-676-LGNT ext. 81.** We'll send you a copy of *The New Leader in Systems Management.* It explains why Legent joined with Goal, and what you can expect from the new team; a team dedicated to providing leading edge solutions for systems management.

Find out how the game has changed. From the players who are changing it.

LEGENT

Grins, grimaces and grit

CONTINUED FROM PAGE 101

is also upgrading its skills with client/server, programming tool kits, design aids, relational databases and Unix training.

With so much going for the IS staff — a profitable, stable company, new hardware, new software and new training — keeping up is still difficult, Wicker says.

▶Future looks bright

For David Berkley, programmer/analyst at the Industrial Commission of Ohio in Columbus, IS couldn't look brighter.

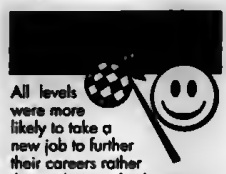
In his first job out of college, Berkley found himself at a state agency that was just starting to automate. "We don't have a lot of constraints," he says. "We are not under budget pressure. It's almost like we have a blank check."

When pressure mounts, IS gets rewarded. During one sticky job, for instance, Berkley found himself working nights and weekends to meet a deadline. But he says the extra effort paid off.

"We have a choice of time-and-a-half or time off. I took the money," he says.

His small IS unit runs an Application System/400 Model B-60 that supports 450 users and the claims tracking application Berkley works on.

He's thrilled with the growing duties he enjoys. "My boss lets me do things that aren't really part of my job description. It gives me a lot of experience."



All levels were more likely to take a new job to further their careers rather than to leave a bad situation

Career advancement	[illegible]
Better pay	42.6%
Escape stress	28.7%
Layoffs	19.3%
Poor communication with superiors	15.2%

Multiple responses allowed

▶'A very trying time'

After eight years of meteoric growth, Haworth, Inc. has fallen back to earth. The morale of the company's IS department has plummeted in the face of staff and budget cutbacks.

"We're in an industry that just matured," says Hal Eckel, director of information services at the Holland, Mich., maker of office furnishings.

Now that the days of high-flying growth are over, the company is battening down, Eckel says. "This is a very trying time," he laments. "There is a lot of pressure, and morale is low."

Still, Eckel doesn't like to dwell on the negatives. "It just pulls you into a downward spiral," he says. The department's productivity, though below peak, is still acceptable, he adds.

To boost sagging spirits, Eckel looks for special ways to reward accomplishment, such as giving out awards for exceptional work. He has also managed to keep salaries above average and continues merit increases. Training and development are also key: IS staffers occasionally get time to pursue an independent research project of their choice.

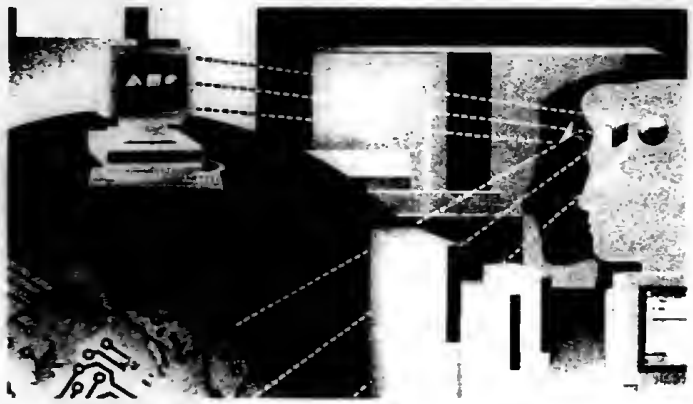
Still, Eckel says, there are no quick fixes, short of a major economic upturn. "When you are dealing with attitudes and emotions," Eckel says, "things take a long time." ●

METHODOLOGY

***Computerworld*'s Sixth Annual Job Satisfaction Survey includes responses from 770 information systems managers and professionals. A total of 2,000 unduplicated names were culled from *Computerworld*'s paid subscriber list. Surveys were mailed on June 24, 1992, and tabulated by IDG Research Services in Framingham, Mass.**

Computerworld, the Computer Society of the IEEE, and NCR Corporation are pleased to announce

"New Ways of Computing"



$60,000 STUDENT ESSAY COMPETITION

New Ways of Computing

Today's students of information technology (IT) will be the movers and shakers of the world tomorrow. Access to the right information at the right time will spell the difference between winning and losing in a global market.

You shoulder a considerable burden, and yet confront tremendous opportunities. The impact of your decisions will have major consequences, for better or for worse, for generations to come.

We ask you to envision the world of computing that you will inherit. The quality of your ideas will influence the changing world of IT — the dawn of a new era of computing. What is the destiny of the information-intensive workplace?

The Challenge

We believe in listening to the next generation of leaders who will shape business, education, and society. That's why we're asking all full-time undergraduate and graduate college or university students to explore the topic, "New Ways of Computing."

The student chosen as the first place winner will be awarded $10,000 in cash and an NCR notebook computer. The second place winner will receive $5,000 in cash and a notebook computer, and the third place winner will receive $3,000 in cash and a notebook computer.

In addition, the professors of the top three entrants will also receive NCR notebook computers.

The Rules

1. The $60,000 Student Essay Competition is open to any full-time undergraduate or graduate student attending an accredited college or university.

2. Entries must be original, unpublished work on the topic, "New Ways of Computing." Essays must not exceed 3,000 words. Discussions should be about the near future of computing and how the field will evolve in the next three to five years.

3. Areas of discussion may include, but are not limited to, open systems, the role of technology in a corporation, the globalization of computers and communications, information distribution or privacy issues, and trends in computer architecture as they relate to multimedia, wireless systems, telecommunications or other such innovations.

4. Entries must be typed, double-spaced on 8 1/2 by 11 bond paper, one side only. A separate cover sheet should list the entrant's name, school, home address, whether undergraduate or graduate, and title of the essay. Subsequent pages should be numbered sequentially and include the essay title in the upper right margin. Winners will be required to produce proof of current full-time college or university enrollment.

5. All entries must be postmarked by December 15, 1992 to be eligible for consideration. Please submit entries to: Manning, Selvage & Lee Public Relations, New Ways of Computing, 79 Madison Avenue, New York, NY 10016. The sponsors are not responsible for, and will not consider, late, lost or misdirected entries.

6. In the event any prize winner is a minor, the cash award will be made to his/her parent or guardian.

7. Awards to individuals will be reported as income on IRS Form 1099. All taxes are the responsibility of the recipients.

8. Award winners will be required to sign publicity releases and affidavits of eligibility and compliance with all rules governing the competition. Failure to return executed affidavits and releases within 15 days of receipt will cause the award to be null and void.

9. All entries become the property of the sponsoring organizations and will not be returned.

10. By participating in this competition, entrants agree to these rules and the decisions of the judges which shall be final in all respects, and further agree to the use of their names, likenesses and entries for *Computerworld*, the Computer Society of IEEE and/or NCR advertising and publicity purposes without further compensation.

State, territorial and country judges will consist of panels that include NCR stakeholders. Final selections will be made from state, territory and country winners by a national panel of judges.

If clarification is necessary, call 513/445-1666, 8am-5 pm EST.

Award winners will be notified on or about May 16, 1993. To obtain a list of finalists, send a self-addressed, stamped envelope to:

1992 Student Essay Competition
NCR Corporation
Stakeholder Relations Division
1700 South Patterson Boulevard
Dayton, Ohio 45479

Form fitting

Going from paper to electronic forms can save companies more than 70% and give users a palatable interface to enterprise data

Mark Fisher

BY MICHAEL A. BRAGEN

A form is the universal medium for communicating business data. By managing paper, companies guide the flow of operational work. Documents travel among departments, collecting the data required for decision-making and leaving a paper trail of transactions.

But paper use is costly. U.S. firms spend nearly $7 billion annually to purchase paper forms — and nearly $100 billion to process, file, store and destroy them.

Enter forms automation software (electronic forms), brought on the scene to cut costs. By bringing design and production of forms in-house, companies can save more than 70% (see chart page 107). The drive to get electronic forms off of large systems and onto personal computer platforms may shrink costs even more.

But saving money isn't the real benefit of forms automation. Through the use of workgroup automation and client/server, enterprisewide connectivity, firms are improving the quality and efficiency of their operations because users get a palatable interface to enterprise data. In the same way that graphical user interfaces such as Microsoft Corp.'s Windows enable better access to systems functions, PC electronic forms act as graphical data interfaces.

The technology of forms automation is not extraordinary; its value is in the linkage of database, data collection and data retrieval/presentation technologies.

Steven Weissman, associate director of publications at BIS Strategic Decisions in Norwell, Mass., refers to the "technology soup" of forms automation, citing the convergence of hardware, software and environments as an enabling factor in the process of collecting and disseminating information.

The high end of PC electronic forms technology is where all the action is for corporations. At the high end, electronic forms packages from firms such as Delrina Technology, Inc. (PerForm Pro) and Jetform Corp. (Jetform) not only enable the design of a form but also provide separate "fill" modules that can be distributed to remote terminals.

Fill modules operate as what-you-see-is-what-you-get data entry screens that look the same as their paper counterparts. The packages act as sophisticated information filters, with automatically calculated fields, table lookups and electronic signature security.

The creator of an electronic form can associate rules and algorithms with each field on the form to guide and constrain users.

For example, on an expenses worksheet, the number of work hours for a given day can be limited to a range of 0 to 18. Also, additional forms can be linked to fields. Answering "yes" on an insurance application to the question of whether a customer smokes can force the completion of a more detailed health form.

KFC Corp. in Louisville, Ky., for one, has set up a pilot project to integrate forms processing through its enterprise electronic-mail systems using Delrina's PerForm Pro, says David Sierra, project manager for the forms management area. The project focuses on automating in-store administrative forms at the company's Canadian subsidiary.

KFC's electronic forms are oriented toward human resources and administrative functions, including performance appraisals, customer complaint forms, supply tracking forms, property loss forms, job descriptions and employee information requests.

Whenever a new store employee begins working at KFC, his manager fills out an on-screen information form containing personnel information. The form and data are then

Continued on page 107

Good form

The market for electronic forms software packages, which range in price from $100 to $495, will beat up by '95

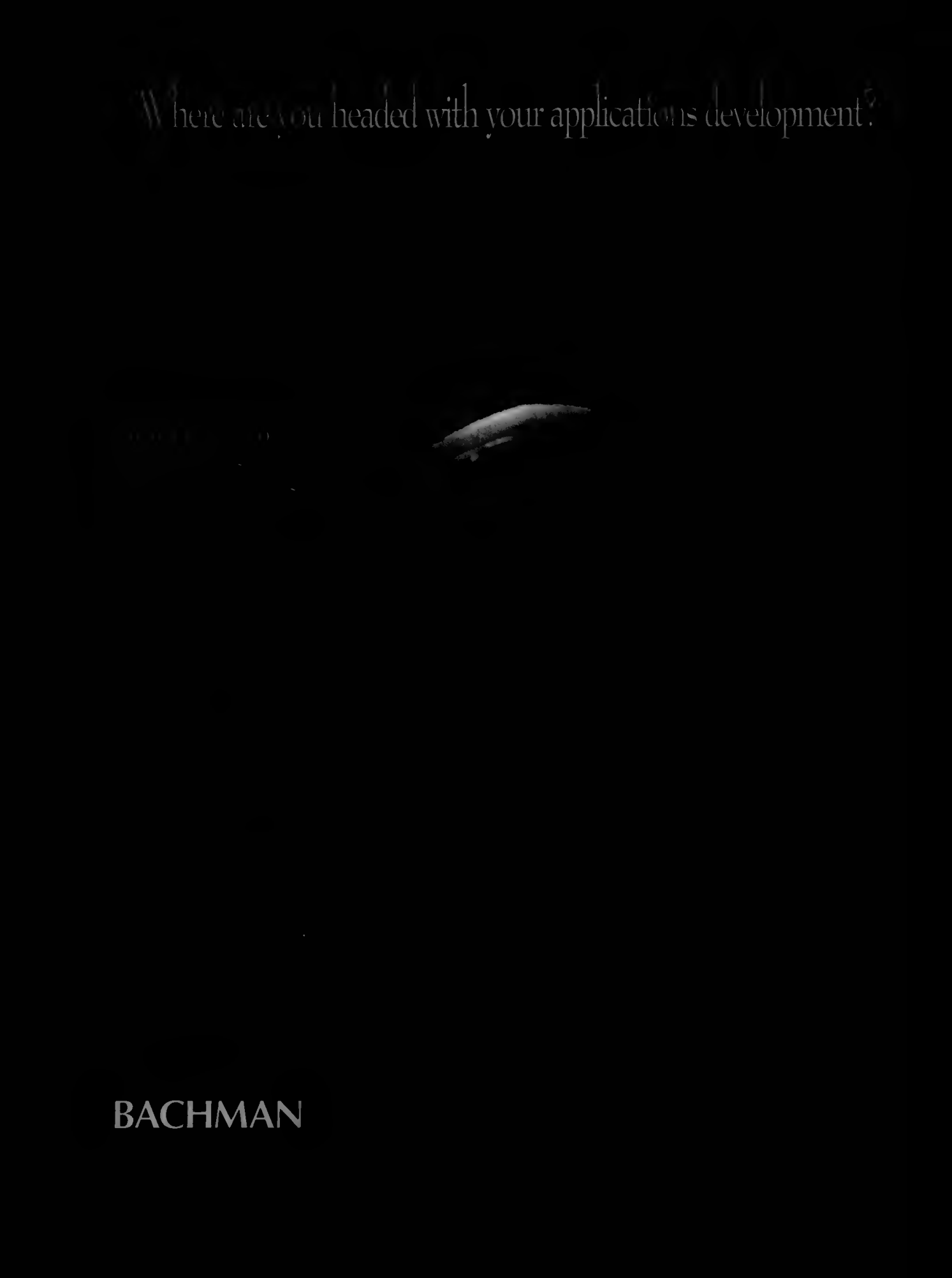
Projected sales (in millions)

1992	$48
1993	$60
1994	$86
1995	$106

Source: Frost & Sullivan, Inc. CW Chart: Janell Genovese

Bragen is a software market analyst and management consultant based in Lexington, Mass. A close watcher of the forms automation industry, he has prepared extensive reports on the market, users and technology.

Where are you headed with your applications development?



BACHMAN

Continued from page 105

routed through the network to the human resources department, where data about employees is stored on a mainframe database. Data from the form is then electronically transmitted to the payroll department, activating the individual's account.

Advanced forms software can also work within peer-to-peer and interconnected client/server networks, enabling users to enter information via electronic forms to remote, distributed databases. Databases can be populated from users entering data simultaneously to on-screen forms.

These more sophisticated electronic forms are crossing the boundary into the realm of database front ends. Forms designers can structure complex SQL queries that can transparently retrieve information from corporate databases and present it to novice users.

At the mortgage department of a large bank in the Southeast, loan clerks fill in on-screen loan application forms for potential customers. Credit history, account balances, outstanding loans and prevailing mortgage rates are instantly accessed from databases connected on the client/server network. The clerk gets a senior loan officer's approval for the loan via electronic signature. Before the customer can walk away — and check out a competitor's rates — he gets the hard copy of the commitment letter, ready for signature.

For its part, Northrop Corp.'s Electronics Division has a department using forms linked via a backbone network to a dBase database for access and entry of human resources data, says Raymond Hernandez, a graphics coordinator in the management systems and procedures department.

Right now, the finance, procurement and engineering departments, each on different workgroup local-area networks, all have access to the company's backbone. Department staffers can call up electronic versions of corporate forms that can be filled in on-screen.

"The second phase will be to connect each department's forms and data over the network using electronic mail," Hernandez says. In the future, all departments will be able to fill and transmit forms and mainframe-based data via Lotus Development Corp.'s CC:Mail E-mail system.

Quick & easy

How do you implement forms automation in the most expedient and least stressful way possible?

The best kinds of forms systems are ones based on careful collaboration by information systems groups and users to find out how many forms are in use and how those forms support tasks employees perform. What information is required to issue a policy for a customer? Which actuarial tables should be used in determining premium rates? How is information on an approved application conveyed to the billing department? Analyze work flow: what happens, in what order, which business units are involved and where the information goes.

Needs must then be matched to available technologies and products ranging from stand-alone PCs to LAN-resident multiple design and fill workstations connected to databases. These products should be tested in an organizational context.

In doing an environmental and work-flow analysis, you may find that your processes or systems set-up need rethinking or that certain sections of the company are more prepared than others to take on the new software.

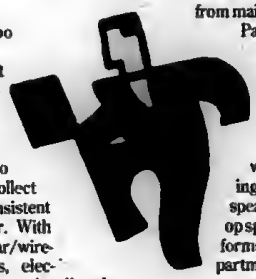
Having forms software in place doesn't mean you should stop your analysis. One major aerospace manufacturer that has been concentrating on forms automation and scrutinizing its processes since 1986 recently encountered architectural problems. The company has a base of nearly 3,000 centrally managed forms it currently uses. However, the number of "bootleg forms" — forms created and used by departments but not officially cataloged and sanctioned — is estimated to be twice that number.

The firm stands to gain significantly from a coordinated automation effort, but in studying its environment, the company found that it has a complicated mixture of systems, which run the gamut from stand-alone desktop forms software (DOS- and Apple Computer, Inc. Macintosh-compatible) to mainframe host-based systems.

The company is currently undergoing a substantial effort to build a consolidated, integrated library of electronic forms.

Extends to field

The kind of information delivery/retrieval forms enable doesn't stop within a company's walls. With electronic forms distributed on notebooks, pen-based PCs and so on, field forces can collect information in a consistent and efficient manner. With the new crop of cellular/wireless communications, electronic forms place automation directly in the hands of the remote user.



Associated Aid for Lutherans (AAL), an insurance provider with $7.3 billion in assets and $1.5 million members, has given its 2,000 sales agents laptops and mobile communications equipment. The agents can call up 40 of the most common forms related to insurance applications while at the customer's location, fill them in on-screen and transmit the collected data to the home office in Appleton, Wis.

The company has reduced the time it takes to process applications because sales agents no longer send completed forms via the mail. While a signed paper application must be on file by law, "between 50% and 60% of applications are processed, and policies are ready to be issued by the time the signed copy is received by mail," says Kay Jacobson, an AAL field automation specialist. Furthermore, she says, electronic forms have virtually eliminated the problem of incomplete or incorrectly filled in forms.

Despite the promise of forms automation, some companies aren't taking advantage of the technology as an information flow enabler. These companies tend to view forms automation in light of its most narrow description: as a design tool that lets users remake a paper form into a computer one. Part of the problem may be a political struggle for control of (and access to) enterprise data, and part may be a misunderstanding of the strategic role forms automation can play in a company.

"We could be doing a lot more with automation," says Kim Miller, senior forms analyst at State Farm Life Insurance Co. in Bloomington, Ill. The firm is using advanced function printing, which enables formatted output of policy data from mainframe databases.

Part of the solution is getting senior and systems management to recognize the value to the firm of providing users with a window on corporate information.

Connie Magers, who works in nonresale purchasing at JC Penney Co. in Dallas, is spearheading an effort to develop specifications for an enterprise forms automation system. Her department, which is responsible for forms procurement and administration, is now completing a series of nearly 50 presentations to senior management and the information systems group on the benefits and workings of forms automation.

The forms and systems professionals in the company have coordinated 00 requirements for the bidding process. "It's a team thing," says Magers, who first garnered the attention of the chief executive officer by pointing out the potential cost savings (50% expected) and environmental benefits of paperwork reduction.

KFC's use of E-mail as a transmission medium for forms-based information hinges on collaboration between the IS, telecommunications and forms management groups to integrate the flow of electronic forms among users. Because of the "uncommon level of coordination" among groups, "we're doing a lot of things right now that I don't think any other company has done," Sierra says.•

Cost accounting

The question always comes up when implementing a new technology: How much is this going to save us?

There is a series of statistics (see chart) on cost benefits of the use of electronic forms. These statistics are based on studies of forms usage conducted by Ryerson College and Corporate Electronic Imaging, a division of IDS Financial Services, in 1989 for Delrina Technology, Inc., a forms software vendor in Toronto.

For companies with 2,500 forms to automate, annual costs of existing paper forms are broken into seven "hard dollar measures" totaling an average of $4 million. Using electronic forms, the costs are estimated to total $1.1 million, a savings of nearly 73%.

A company with 2,500 paper forms that uses electronic forms, the study indicates, should save more than $18 million per year.

CW Chart: Stephanie Faucher

Re-writing your favorite mainframe applications makes about as much sense as re-inventing the wheel.

But that's how it feels if you are moving to Unix while your programs stay on the mainframe.

We'll help you port your existing applications to Unix. So, instead of wasting time re-writing them, you spend it writing new ones.

uni-SPF™ Includes Dialog Management Services!

uni-REXX® Easy ports for existing applications.

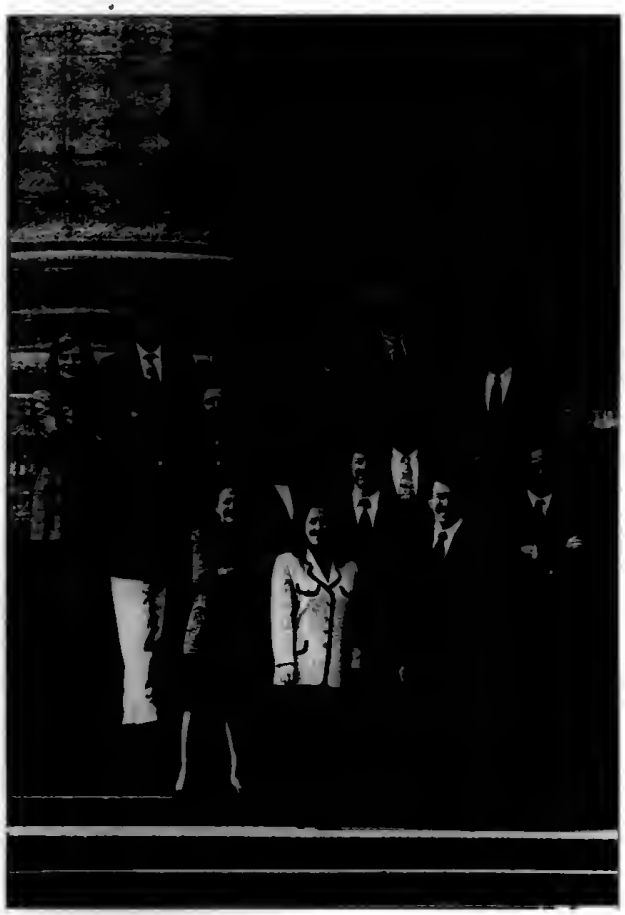
uni-XEDIT® Familiar full-screen editor.

the workstation group
the business choice for open systems

800-228-0255

wrk/grp® the workstation group

Celebrating 20 years of worldwide customer success.



SAP employees proudly celebrate 20 years of worldwide customer success. Over 1600 customers use individual or enterprise-wide SAP applications software. To find out more, call ***1 (800) USA-1SAP.***

We're celebrating our 20th anniversary. For two decades, SAP has helped customers achieve business goals with integrated financial, manufacturing, sales, distribution and human resources software. Software engineered to help improve customer service and product quality, accelerate time to market and improve operations processes. Software designed to provide you better control over your business.

But that's only the half of it.

SAP applications software lets you leverage both your hardware resources and information systems investment. So, to celebrate the past 20 years of worldwide customer success, we're engineering the next.

TWENTY YEARS
20
OF PRECISE SOLUTIONS
SAP
Integrated software. Worldwide.℠

SAP • Amsterdam • Atlanta • Brussels • Budapest • Chicago • Copenhagen • Heidelberg • London Madrid • Milan • Paris • Philadelphia • San Francisco • Singapore • Stockholm • Sydney • Toronto Vienna • Zurich

MANAGER'S JOURNAL

EXECUTIVE TRACK

U.S. Intelco Networks has a new director of information services: **Ken Hughes.** The 20-year information systems veteran arrived at the Olympia, Wash.-based independent telephone company consortium after 10 years as MIS director at Westin Hotels & Resorts. In his new post, he will manage the development, application and maintenance of U.S. Intelco's in-house systems, support of data center operations and maintenance of the consortium's data communications and networks.

Sheldon L. Azine, a 23-year veteran of **The Federal Reserve Bank of Minneapolis,** has been named senior vice president of the bank. Azine, who now assumes senior responsibility for the personnel, automation/communication and administrative services departments, most recently served as vice president and deputy general counsel. Also on his way up at the bank is **Thomas E. Kleinschmit,** who moves from assistant vice president to vice president. Kleinschmit became managing officer of the securities, cash, network services and electronic payments departments of the bank he has served for 21 years.

As of last month, **John J. Lane** is the chief information officer of the **Securities and Exchange Commission** (SEC). The CIO comes to the SEC from Shearson Lehman Brothers, Inc., where he served as executive vice president and director of communications. In prior jobs, Lane — an attorney as well as an IS executive — was vice president of an IS services division of Computer Sciences Corp.

Tandycrafts, Inc. President and Chief Executive Officer **John Sandlin** said he would step down from the spot he held for eight months to return to his former job as Tandycrafts' vice president and IS director.

Electronic meetings: No more zzz's

Software helps managers save time, money while conducting more effective meetings

BY ROSEMARY HAMILTON
CW STAFF

We have all been to meetings from hell, those seemingly endless sessions with questionable cause and less effect. Some of our best doodles and daydreams have resulted from them.

And we could shrug them off as another quirky part of business life if they were not consuming such huge amounts of time. According to the New York-based American Management Association, executives spend at least 50% of their time in meetings.

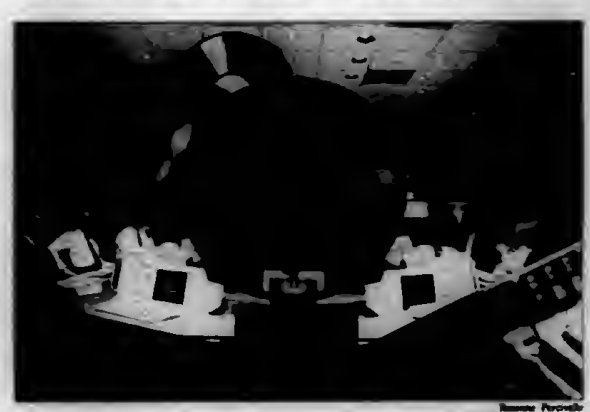
"Managers need to look at the kind of money they are spending to put people in a room to make some decisions," says Virginia Johnson, manager of the 3M Co. Meeting Management Institute, a meeting information clearinghouse based in Austin, Texas. What's more, many organizations are moving toward more team-oriented management as well as reorganizing the rank and file along team lines. That could mean more meetings than ever before.

"The biggest factor is we are increasingly working in teams that form and do tasks and then disband," says Hudi Cantrel, a program manager in information systems services and technology at Palo Alto, Calif.-based Hewlett-Packard Co. "We feel these teams need all the help they can get."

Trends like these are making managers look at meetings as very serious business these days. For many, meeting management is becoming a core aspect of ongoing total quality initiatives or teamwork research. Managers and consultants contacted recently said two key elements promise a meeting productivity boost.

First is a recent batch of personal computer-based meeting support software tools. Second is a meeting manager or facilitator who can guide the meeting process with the help of these tools (see chart page 113).

The tools are being used in so-called decision rooms, which are actually conventional meeting rooms equipped with personal computers and software that allow people to present ideas, rank action items and document the meeting electronically. Some also provide for a "virtual meeting," enabling people to tap in from various locations and attend electronically. In both cases, the tools allow for anonymous input, which is a critical factor in getting more honesty and more ideas from the meeting, many observers say.



Decision rooms *equipped with PCs and software allow managers and staff to present ideas and document meetings electronically*

Formal and informal research currently afoot at user companies is showing the potential benefits of this approach. The Boeing Co. based in Seattle, for instance, conducted a nine-month study in which 64 groups used meeting software. In a paper submitted to the Institute of Electrical and Electronics Engineers, Inc. last year, the company reported 1,773 calendar days saved during the period, a figure established based on estimates of what the group time would have been had conventional meetings been conducted.

More recently, a technical support group at Pittsburgh-based Westinghouse Electric Corp. met to establish

Continued on page 113

Feds seek EDI contracting solution

BY MITCH BETTS
CW STAFF

Give them credit. Some federal agencies really are trying to become more efficient and slash paperwork.

But when they try to adopt paperless business practices such as electronic data interchange (EDI), they run up against their own outdated regulations.

The "paper culture" is so embedded in the federal bureaucracy that many of the government's internal regulations require the use of handwritten signatures on paper forms, experts said. The U.S. Food and Drug Administration (FDA), for example, found that its regulations call for signatures in no fewer than 132 different sections.

Consequently, the FDA has launched a proceeding asking for public comment on how to revise its regulations to accommodate electronic records and alternative forms of "human endorsement."

The agency said it will evaluate the legal acceptability, integrity and security features of all sorts of alternative signature schemes, including smart cards, biometric devices, passwords, encrypted digital signatures and pen-based computers.

"Although the FDA recognizes that virtually any system can be corrupted . . . substitutes for handwritten signatures should nonetheless be at least as secure as conventional handwritten signatures," the FDA stressed.

Agencies such as the U.S. Department of Defense could make greater use of EDI for purchasing supplies from the private sector if federal acquisition regulations were updated to permit electronic records, said Daniel J. Drake, a research fellow at the government-funded Logistics Management Institute in Bethesda, Md.

Some government administrators resist electronic contracting out of fear that paperless records will not hold up in court, Drake said in a recent report. However, the U.S. General Accounting Office has ruled that computerized records with electronic signatures are as legally valid as paper forms, as long as there are adequate security controls.

In some cases, high-level government directives supporting electronic commerce have been issued, Drake said. However, they have not proven sufficient to expunge the bureaucracy's pro-paper bias.

Low-level officials are either "overly cautious" about the legality issues or simply have not incorporated EDI into their day-to-day business procedures, he said.

COMMENTARY

Les Gilliam

The check's in the mail

Disaster recovery is a checklist item these days — assuming you've got a mainframe shop. But at the decentralized or downsized IS operations that are increasingly dotting the corporate landscape, it's more like a case of "the check is in the mail."

As they take on more autonomy over their own work, PC and workstation users are also inheriting a bunch of responsibilities they don't necessarily want and often aren't up to. I just completed a consulting project for a huge Fortune 1,000 company division that had moved to client/server. When it came to disaster recovery, they didn't have a clue.

And this firm is far from exceptional. In the downsized, decentralized world, disaster recovery is spending a lot of time on the back burner — a lapse in protection that no information-reliant firm can afford.

Is there anything the IS chief and whatever remains of the centralized IS organization can do to head off the trouble that's brewing? You bet:

- **The economy package:** There are tools available for providing centralized backup and restoration service. Get them and offer this partial disaster recovery to the decentralized, often downsized users on a service bureau basis.
- **The whole hog:** Offer to set up and provide complete disaster recovery for the IS paladins. Sooner or later, somebody is going to — and the internal IS shop can do a quality job more economically than a costly outside systems integrator.
- **Spread the good word:** Central IS is ideally positioned to share its knowledge of what the various departments at its own firm and at others it might be observing are doing to put industrial-strength disaster recovery at the service of user-dominated computer operations.

At worst, any of these alternatives stands to win centralized IS a few new friends and move the firm further into the zone of protection it is now wandering away from. At best, they stave off disaster while showcasing IS as a potential profit center.

Whichever tack you take, however, remember that among the downsized, disaster recovery isn't a burning problem waiting to be solved; it's more likely a nonissue. The place to start is scratch. Users need to define the term "disaster." Are they concerned only about acts of God such as Hurricane Andrew, or does a major server failure qualify? Shouldn't there be a plan for recovering from any type of system failure?

Constructing a list of scenarios can help get users involved in the forging of the definition and disaster recovery blueprint that will serve them best. These scenarios basically cover the territory:

- **Emergency response:** What should employees actually do if disaster strikes? Emergency phone numbers, escape routes, fire extinguishers, utility cutoff valves, switches and handy flashlights are among the items to acquire.
- **Alternate site required:** If so much damage occurs that an alternate site is needed, prior planning will have analyzed alternatives and selected the most feasible plan for moving people and machines. Often, user departments can establish mutual backup arrangements and configure accordingly in advance.
- **Hardware replacement required:** If hardware has been destroyed or damaged beyond immediate repair, the user should be able to turn to prepared documentation for quick replacement action. Letters of commitment from vendors may help get priority response. Up-to-date inventory records will provide configuration details for placing orders. Prearranged purchase order numbers can also help shorten the time frame.
- **Repair required:** Day and night numbers for vendor reps and their alternates — beepers and car phones included — are a must. Fine-line attention to maintenance contract details can help, too.
- **Power loss:** Beyond the acquisition of an uninterruptible power supply facility, your key to rapid recovery lies, once more, in knowing the name and 24-hour access number of your firm's person in charge of electrical power, as well as the appropriate contacts at the power company and their alternates.
- **Loss of telecommunication facilities:** Whether for local-area cabling, building wiring or WANs, analysis and documentation are often slighted. Therefore, backup units for routers, bridges and the like are a smart investment.
- **Outage of unknown origin:** Arm yourself with the names and 24-hour phone numbers of various experts both inside and outside the company.
- **Above all, publicize:** From little tips to 12-step plans, make sure that every bit of information that can help users recover quickly after any computer setback is widely known, easily accessed and clearly communicated.

And one more suggestion: Don't keep the only copy of the recovery plan on-line.

Gilliam is president of Gilliam Associates, a computer management consulting firm based in Ponca City, Okla.

A New DEXPO.

Us Develop

Las Vegas, December 8-10, 1992 begins a new decade for DEXPO. It's your opportunity to experience the future as it develops. As one of the millions of DEC users, you know DEC is expanding to include Alpha-based products, and full migration to Open Systems interoperability.

With all the changes in the DEC market, you need to attend DEXPO. Keep up with the latest developments at DEXPO, the only independent trade show and seminar serving the DEC 3rd-party and compatibles market. A Fall seminar series. Next Spring, a full management conference. A mix of traditional and timely management oriented issues featuring key industry participants.

DEXPO impacts the entire DEC universe. Call 800-87-DEXPO for more information.

DEXPO®

Only DEXPO gives you the whole picture.

December 8-10, 1992 • Las Vegas, Nevada • 800/87-DEXPO

Held concurrently with the DECUS Symposium.

Owned and produced by Miller Freeman, Inc.

© 1992 Miller Freeman, Inc.

CALENDAR

SEPT. 27-OCT. 3

Downsizing and Rightsizing Conference and Exposition. New York, Sept. 28-Oct.2 — Contact: Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-9731, Ext. 294.

The Sixth Annual Strategic Issues Conference and Client Forum. La Jolla, Calif., Sept. 29 — Contact: Computer Intelligence, Santa Clara, Calif. (408) 980-4300.

CASE World: The National Application Developers Exposition. Boston, Sept 30-Oct. 1 — Contact. Digital Consulting, Inc., Andover, Mass. (508) 470-3880..

CASE World Conference & Exhibition. Boston, Sept. 30-Oct. 2 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

CD-ROM Expo '92. Boston, Sept. 30-Oct. 2 — Contact: Mitch Hall Associates, Dedham, Mass. (617) 361-2001.

Software Publishers Association (SPA) Annual Conference. Washington, D.C., Sept. 30-Oct. 3 — Contact: SPA, Washington, D.C. (202) 452-1600.

1ONET Power Breakfast. San Diego, Oct. 1 — Contact: S.S. Smith Associates, Waynesville, Ohio. (513) 897-0655.

Graph Expo East '92. New York, Oct. 3-6 — Contact: Graphic Arts Show Co., Reston, Va. (703) 264-7200.

OCT. 4-10

The New Tools for Design and Design Production Conference. New York, Oct. 4-6 — Contact: The Center for Computer Graphics for Design, Santa Fe, N.M. (505) 986-0523.

Repository AD/Cycle International Users Group Conference. Chicago, Oct. 4-7 — Contact: Repository AD/Cycle Group, Santa Monica, Calif. (310) 394-8305.

Multivendor and Third Party Computer Maintenance Conference. San Francisco, Oct. 5-6 — Contact: Frost & Sullivan, Inc., New York, N.Y. (212) 233-1080.

Electronic Data Interchange Association (EDIA) Annual Conference. Nashville, Oct. 5-8 — Contact: Gregory Harter or William Myers, EDIA, Alexandria, Va. (703) 838-8042.

Scan-Tech '92. Anaheim, Calif., Oct. 5-8 — Contact: AIM USA, Pittsburgh, Pa. (412) 963-8588.

REXSYS Users Conference. Boston, Oct. 6-9 — Contact: Recovery Management, Inc., Littleton, Mass. (508) 486-8866.

OCT. 11-17

The Third Annual East/West High-tech Forum. Prague, Oct. 11-14 —Contact: Edventure Holdings, Inc., New York, N.Y. (212) 758-3434.

USE, Inc.'s Fall Conference. Atlanta, Oct. 12-16 — Contact. USE, Inc., Lanham, Md. (301) 577-1881.

Europa Telecom '92. Budapest, Oct. 12-17 — Contact: International Telecommunication Union, Switzerland (011-41) 22-730-5926.

Enterprise Network Management Seminar. Elmsford, N.Y., Oct. 13-15 — Contact: Hart Rasmussen, Polytechnic University's Center for Advanced Technology in Telecommunications, Westchester, N.Y. (914) 347-6940.

Networld '92. Dallas, Oct. 13-15 — Contact: Kathy Ryan, Networld, Fort Lee, N.J. (201) 346-1400.

Multimedia World, Inc. Conference. Chicago, Oct. 13-16 — Contact: Jim Prude, Multimedia World, Alexandria, Va. (703) 684-5401.

OCT. 18-24

Info/Tech Management '92. Nashville, Oct. 18-21 — Contact: Data Processing Management Association, Park Ridge, Ill. (708) 825-8124.

Riscon '92 Conference and Exhibition. New Orleans, Oct. 18-21 — Contact: National Retail Federation Division, New York, N.Y. (212) 244-8780.

Society of Information Management (SIM) 1992 Annual Conference. Universal City, Calif., Oct. 16-21 — Contact: SIM, Chicago, Ill. (800) 477-4561.

APICS Conference and Exhibition. Montreal, Oct. 16-23 — Contact: The Educational Society for Resource Management, Falls Church, Va. (703) 237-8344.

Directions '92. Dallas, Oct. 19-22 — Contact: Cognos, Burlington, Mass. (617) 229-6600.

International Society for Hybrid Microelectronics '92. San Francisco, Oct. 19-22 — Contact: Terry Ritter, San Jose, Calif. (408) 945-9992.

OCT. 25-31

The 12th Annual Treasury Management Conference. San Diego, Oct. 25-28 — Contact: Treasury Management Association, Baltimore, Md. (301) 907-2862.

ASIS Annual Meeting. Pittsburgh, Oct. 26-29 — Contact: Richard B. Hill, ASIS, Silver Spring, Md. (301) 495-0900

Total Quality Management '92 Conference and Exhibits. Chicago, Oct. 27-28 — Contact: Pat Jones, Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-1500.

Outsourcing the Help Desk Conference. Colorado Springs, Oct. 27-30 — Contact: Help Desk Institute, Colorado Springs, Colo. (719) 531-5136.

Educom '92. Baltimore, Oct. 28-31 — Contact: National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

Expo Comm China. Beijing, Oct. 30-Nov. 4 — Contact: Wendy Pang, E. J. Krause Associates, Hong Kong. (011) 5-773-343.

NOV. 8-14

U.S. Society of Wang Users (USSWU). Boston, Nov. 9-13 — Contact: USSWU, Chicago, Ill. (708) 652-3888.

12th Annual Eastern American NCR/AT&T Computer Users Conference. Lake Harmony, Pa., Nov. 12-13 — Contact: Frank Whalen, Tinius Olsen Testing Machine Co. (215) 675-7104, Ext. 216.

Synergy '92. Anaheim, Calif. Nov. 9-13 — Contact: Weingarten Publications, Inc., Boston, Mass. (617) 542-0146.

NOV. 15-21

International Security Systems Symposium and Exhibition. Washington, D.C., Nov. 16-18 — Contact: Krause & Associates, Bethesda, Md. (301) 986-7800.

NOV. 29-DEC. 5

CAUSE '92. Dallas, Dec. 1-4 — Contact: CAUSE, Boulder, Colo. (303) 449-4430.

THE PAINLESS PILGRIMAGE FROM ANALOG TO DIGITAL

Sooner or later, you've got to make the move from analog to digital for your data communications. And contemplating the trip is a little spooky.

Here's the way to make the pilgrimage both painless and profitable.

Just stick with UDS.

Years of industry leadership in high-speed modems have taught UDS the ins and outs of the telephone system—both leased line and dial-up. That knowledge has now been transferred to the developing world of the digital telephone network. At UDS, more than a dozen digital devices—DSU/CSUs, (DDS, T1, fractional T1, T1-ESF) switched 56 and ISDN terminal adapters and termination devices—are already being shipped. They are appropriate for a wide variety of applications—present and future.

SW56U	Accunet Sw. Digital	56 Kbps	4-wire Sw. Digital	Keypad, Autodialer
DU100	Datapath Sw. Digital	64 Kbps	2-wire Sw. Digital	All Rates
DU170	Datapath Sw. Digital	64 Kbps	2-wire Sw. Digital	Keypad, Autodialer
TA120	Terminal Adapter	2 Ch. @ 64K 1 Ch. @ 16K	ISDN	Supports Voice & Data
TA220	Terminal Adapter	2 Ch. @ 64K 1 Ch. @ 16K	ISDN	Combines "B" Channels
DDS/MR1	DSU/CSU	56 Kbps	DDS	All DDS Rates
DDS/MR2	DSU/CSU	56 Kbps	DDS	DDS with Sec. Channel
T1-ESF-CSU	CSU	1.544 Mbps	T1	ESF & 04 Framing

Every pilgrimage is easier with a reliable guide, so save yourself the stress, the false starts, the unnecessary expense. As you go digital, look to UDS for applications expertise, reliable products and competitive pricing. Call:

800-451-2369

UDS

MOTOROLA

Quality Means The World To Us.™

Nov. 9, 1989 - The Berlin Wall, the world's symbolic communication barrier, crumbles under the resounding cries for freedom.

IMAGINE THERE WERE PEOPLE COUNTING ON YOU FOR A WAY TO COMMUNICATE. COME TO THINK OF IT, THERE ARE.

Okay, so the barrier between micros and mainframes is hardly a Berlin Wall. Still, you have to admit, it hasn't exactly helped the free flow of information. For that matter, neither have the walls between Windows,™ DOS, Mac™ and OS/2.® Between LANs and hosts, different LAN topologies...whatever.

But take heart. Because as fast as the new technologies build new communications barriers, we're finding ways to help you break them down.

With DCA,® one family of micro-to-mainframe software runs Windows, DOS, Mac and OS/2 *(the IRMA™ WorkStations and DCA/Microsoft® Select™ Comm Workstation)*. For LAN-to-host connections, three different client operating systems can run through one gateway *(DCA/Microsoft Select Comm Server or IRMALAN™/EP)*. And, you can extend your LANs to remote PCs *(Remote LAN Node™)*. There are even token-ring boards for PCs and Macs which let you change your PC architecture, cabling and speeds without having to buy a new board *(IRMAtrac™ and MacIRMAtrac™)*. As for async communications, you won't find a more "award-winning" family of software than ours *(Crosstalk®)*.

BREAKTHROUGH COMM SOLUTIONS FOR DOS, MAC, WINDOWS & OS/2; SYNC & ASYNC; WORKSTATIONS; GATEWAYS; TOKEN-RING LANS, AND REMOTE PCS.

THE FREEDOM TO COMMUNICATE.

DCA

With all these communications solutions backed by a support and migration program as innovative as the products themselves *(the DCAdvantage™)*, no one's doing more to help you overcome the differences that divide.

So call **1-800-348-3221, ext. 10E***, and get your choice of demo disks and a free guide to breaking down your communications barriers.

After all, a lot of people are counting on you for the freedom to communicate.

*Or call (404) 475-8980 if outside the U.S. ©1992 Digital Communications Associates, Inc. All rights reserved. DCA and Crosstalk are registered trademarks and IRMA, IRMALAN, IRMAmail, MacIRMAtrac, Select, IRA and DCAdvantage are trademarks of Digital Communications Associates, Inc. Microsoft is a registered trademark and Windows is a trademark of Microsoft Corporation. All other brand and product names are trademarks or registered trademarks of their respective owners.

Electronic meetings save time and money

CONTINUED FROM PAGE 109

key issues it would need to address in the upcoming year. This annual process typically takes about two months as the team holds meetings large and small, summarizes the data and then reconvenes for a round of follow-up meetings, says Jeff Jury, a senior consultant at the Westinghouse Productivity and Quality Center.

This time, however, the team armed itself with meeting support software from Collaborative Technologies, Inc. in Austin, Texas, and got to work in a former PC training center that is now converted into a decision room. "We were able to cut about three weeks off what was their normal cycle time on actually deciding what the issues would be that they would address," Jury says.

Jury stresses there's no magic here. Visionquest, the Collaborative Technologies software, along with competing products such as TeamFocus from IBM and GroupSystemsV from Ventana Corp. in Tucson, Ariz., are pretty straightforward, he says.

Specifically, the software allows teams to construct meeting agendas, brainstorm, submit ideas for discussions, build a decision list and then vote on prioritizing the items on that list. Each meeting member sits at a PC and enters ideas — and can do so anonymously. The collective ideas are displayed in real time on the PC monitors — or in a decision room setting, shown on an overhead screen.

"It helps to lessen the influence of power," says Brad Jackson, assistant to the general manager of information technology at Houston-based Texaco, Inc., which has used a decision room for nearly two years. "You want to hear from everyone in a team meeting . . . and people tend to agree with the manager or not speak up. With these kinds of tools, everyone contributes. Ideas become the focus, not the people who [raised] them."

Jackson and other users say at least three key benefits result from the software: shorter meetings, better meetings and documented meetings.

First, meetings tend to run much more quickly. With established agendas and a meeting facilitator guiding the process, people are less likely to stray from the appointed issues. During a nine-month period last year, Marriott Corp. ran 300 meetings in a decision room. The average meeting was completed in one-tenth the time it would normally take, says Carl DiPietro, a former vice president of human resources at Marriott who started his own consulting firm in June.

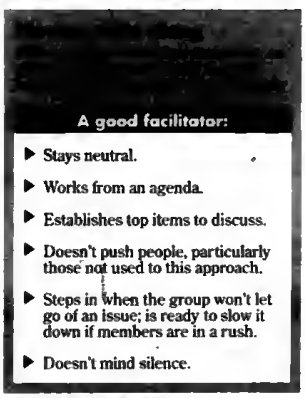
In addition, because ideas are submitted simultaneously, brainstorming sessions move more rapidly than the conventional one-speaker-at-a-time format.

At Metropolitan Life Insurance Co. in New York, a recent brainstorming session ran for 14 minutes "before we cut it off, and we got 287 ideas," says Barbara Myers, director of strategic technology resources in IS. "You would never get that [from a conventional meeting] in 14 minutes."

The third benefit comes from documentation, which can be distributed upon adjournment. This in turn becomes a resource for the staff and cuts back on the need to review the previous meeting's activities at the next gathering.

However, managers and consultants note that the tools have downside potential as well. The key is to avoid overusing the technology and letting it become the primary form of communication among meeting members. For instance, the group should use the software to input ideas and vote; then, once the priority list is established, it should have traditional discussions.

"When the technology becomes more important than the content of the meeting, then you've got a problem," 3M's Johnson says.



A good facilitator:

- Stays neutral.
- Works from an agenda.
- Establishes top items to discuss.
- Doesn't push people, particularly those not used to this approach.
- Steps in when the group won't let go of an issue; is ready to slow it down if members are in a rush.
- Doesn't mind silence.

Source: Executive Strategies, National Institute of Business Management, Inc

HOW TO SELL USED EQUIPMENT.

Advertise in Computerworld's Classifieds. They work.

800-343-6474 x744

Now there's a true high-performance information service with automatic transmission.

It's called DowVision, and it could very well make manual information retrieval a thing of the past. Because it brings you the power of the world's premier business and financial news services automatically, and at turbocharged speed.

Here's how it works. Based on customized profiles that can be set up for your entire company, or each department, or even individual users, DowVision delivers precisely the kind of news and information your staff needs. And only what they need. (These profiles are simple enough for anyone to set up, and just as simple to change.)

DowVision selects this news from the vast resources at its command, including Dow Jones' widely respected real-time newswires and the full text of *The Wall Street Journal*, as well as BusinessWire and PR Newswire. And delivers it automatically, which means the news arrives while it's still news.

Just as important, it arrives for a fixed monthly fee so affordable that direct access to real-time business news need not be limited to just a few members of your staff. And DowVision is easily incorporated into your company's enterprise-wide network, or its various LANs.

All of which makes DowVision the one information service that can automatically enhance your company's performance. For more information, just call our toll-free number.

For more details, call
1-800-522-3567, Ext. 751.

DOWVISION™
The lifeblood of business.™
Another service from Dow Jones Information Services

DowVision is a service mark and The Wall Street Journal is a registered trademark of Dow Jones & Company, Inc. © 1992 Dow Jones & Company, Inc. All rights reserved. 0992

The World's

Network Computing Event.

COMDEX®/Fall '92

The world's #1 computer and communications marketplace for resellers and corporate decision makers.

FAX NOW!
617-449-2674

☐ Send information on attending, including hotel and travel information.
☐ Send information on exhibiting.

Name _____
Title _____
Company _____
Address _____
City _____ State _____
Zip/Postal Code _____ Country _____
Telephone (____) _____ Fax (____) _____
Or, mail to COMDEX/Fall '92, 300 First Avenue, Needham, MA 02194-2722 USA.

©1992 The Interface Group • 300 First Avenue, Needham MA 02194-2722 USA • Tel (617) 449-6600
COMDEX is a property of INTERFACE GROUP - NEVADA, Inc.

0673BA03

COMPUTER CAREERS

What does it take to get a job these days?

BY LESLIE GOFF
SPECIAL TO CW

You're ready for a career change, but the classifieds seem thinner every Sunday, competition is getting stiffer, and the couple of interviews you managed to snag have made you start biting your nails again.

Job hunting can be frustrating, but securing a new position is not impossible. In fact, *Computerworld* tracked down three of this quarter's new hires to find out how they landed jobs in such tough economic times. The keys to their success were diligence, patience, sharp interviewing skills and knowing what they wanted.

Kevin Coleman, a senior Oracle Corp. programmer/analyst at Bolt, Beranek and Newman (BBN), a diversified high-technology firm in Cambridge, Mass., found his current job after an eight-month search he began when layoff rumors started flying around at his former company.

Coleman launched a selective, deliberate strategy of scanning the Sunday classifieds. "If I didn't think I hit all the ingredients in an ad, I didn't respond," he says. "I didn't want to waste my time going to interviews just to be told I wasn't qualified for the job."

This strategy highlights a common complaint among information systems managers: "Don't send in a resume when you don't have those skills listed in the ad," says Coleman's new boss, Stuart Markowitz, MIS applications manager at BBN.

Although Coleman's strategy landed him several interviews, he still didn't receive any offers. He finally contacted an IS recruiter, through which he snared the BBN position. Markowitz says Coleman's skills and job experience gave him a foot in the door, but it was his attitude of confidence and honesty during the interviews that set him apart.

"Very few people come into an interview with all the skills we need, and we know that," Markowitz says. But he says he likes applicants who demonstrate the ability to "absorb new information quickly and jump on."

Coleman says he feels he clinched the interview because he followed the advice of an article he read. The article told interviewees to stay focused, to be energetic but not overbearing, to be upbeat and not to rake their employer over the coals.

Fran Moss had better luck in the classifieds. In May, she began scanning the Sunday newspaper and sent out five resumes a week. By the end of July, she had interviewed with three companies and landed her present position as a systems analyst working with end users on financial applications at the Memorial Medical Center in Jacksonville, Fla.

Perseverance *key to Coleman's search*

"I was very limited on the amount of time I could spend because I didn't want my employer to know I was looking," she says. She looked for ads only from large companies and never responded to ads that listed only post office boxes. Moss says she did not limit herself to particular industries. "With the economy the way it is, you can't be choosy."

On her first two interviews, she found herself either over- or underqualified. But her financial skills were just what Memorial Medical was looking for.

"After my third interview with them, they brought me back to the area where I would be working, and I got to talk to other systems analysts," Moss says. "I got to ask about the longevity of the staff, technical questions — I got a much better feel for the position that way."

Bob Rittler didn't take the classified route but landed a job anyway — and he wasn't even looking for one.

Although he had been unhappy in his job as a software engineering supervisor, he didn't try to make a move until his wife launched a job search through a local IS recruiter.

"She came home with a bunch of different job descriptions, and I glanced through them because there were some positions dealing with geographic information systems (GIS)," a technology he was interested in, Rittler says.

He called the recruiter and was sent to interview for a GIS-related position at TV Answer, Inc., a company involved in the interactive television industry.

Although TV Answer interviewed Rittler for a GIS project, the company decided to reorganize the IS department to leverage Rittler's management and technical experience. He was named manager of business applications, and another interviewee landed the GIS position.

"It's a start-up, and a year from now who knows what will happen," he says, "but I knew I would learn a lot, and the job has incredible upside potential."

Goff is a New York-based free-lance writer.

Grass may be greener

If you're sick of your job and haven't had any luck finding a new one, your background and skills may be of more value in another area of the country. Joan Savaree, director of recruiting and staffing at Computerpeople in St. Petersburg, Fla., warns that IS professionals considering relocation should research the area they've chosen before making a move. She suggests turning to the following sources for information:

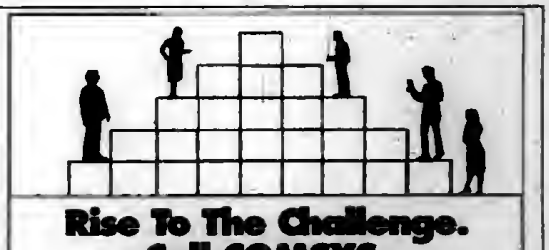
- The American Chamber of Commerce in Washington, D.C., or the local chamber of commerce in the city you are considering for information on an area's largest employers.
- The local board of realtors for rental rates, average housing costs and the average square footage of apartments and houses. This will help you compare what you have with what you get.
- Local newspapers to get a flavor of the city. Newspapers also can help you determine average salaries and job availability.
- Local chapters of national industry associations for information on potential employers.
- User groups for the software or hardware platforms that you use for an opportunity to work with that technology.

Software Engineer involved in the conversion of "legacy" Information Management applications to client/server environments & the development of new clients & servers to replace or supplement existing applications. The applications involved, control the generation of part structure & nomenclature for the ordering & management of software products, provide engineering product description & introduction tools & provide tools for the description of physical & electronic product deliverables in a software publishing environment (specifically books, media, kits, & electronic deliverables). Among the tasks involved in this job are design & implementation of GUIs (Graphic User Interfaces) in a DECWindows environment; codification of production & control standards for nomenclature, structure, & ECO control as clients & servers; design of "wrappering" strategies for existing non-client based applications; management of releases to worldwide manufacturing & engineering locations; & analysis of user requirements in a standards context & proposals for solutions to new process & business practices from users. Requirements for this position include a Master's degree in Computer Science or Computer Engineering, plus 2 years work experience as a Software Engineer. Also required is proficiency in C & Cobol. Background in client server technology, database systems, UNIX, computer communications, systems analysis, design of compilers, & artificial intelligence is also required. 40 hr work week; 8:15 a.m. to 5:00 p.m. Salary $40,019.20. If you are interested in the above position, please forward (2) resumes to Attention: Case #21114, P.O. Box 8968, Boston, MA 02114 EOE

CA & AZ CONTRACTS
CONSULTANTS WANTED
P. Murphy & Associates, Inc.
4405 RIVERSIDE DR., SUITE 100
BURBANK, CA 91505
(818) 841-2002 (714) 552-0506
FAX (818) 841-2122
Member NACCB

TPF
Atlanta Fortune 100 company has excellent opportunities for experienced TPF professionals. Positions range from operations analyst thru application development analyst. These positions are immediate. Salaries range from $50-$70K. Call (404) 604-3980
ROMAC
Three Ravinia Drive
Suite 1460
Atlanta, Georgia 30346

Caring People ... Caring for People
SENIOR PROGRAMMER ANALYST
We are seeking an experienced PCS/ADS programmer to fill a critical position. This position requires a bachelor's degree in computer science or a related field and a minimum of 3 years of experience (preferably in health care). We will consider experience in lieu of the education requirement. COBOL programming experience, IBM mainframe, MVS experience including JCL and Command Level CICS is required. Working knowledge of VSAM data structure and clinical systems experience is preferred.
We are a growing 367 bed medical center located in Southwest Missouri. Close to Branson, the lakes and attractions of the area offer many opportunities to enjoy an active lifestyle. We offer paid interview expenses, relocation allowances and one of the lowest cost of living indices in the nation. For more information please call 1-800-636-7074, or submit your resume in confidence to:
Howard Smith
Employment Manager
St. John's Regional Medical Center
2727 McClelland Boulevard
Joplin, MO 64804
equal opportunity employer m/f/d/h



Rise To The Challenge. Call COMSYS.
If you are at the top of your field and thrive on challenging opportunities to master new technologies, call COMSYS today. We're a leader in supplying Fortune 500 companies with computer software consultants. COMSYS provides competitive salaries and full benefits. We're looking for professionals with the following skills to become part of our nationwide team.

OS/2, PM, C	ORACLE	SAS	Adabas/Natural
DB2 CICS	UNIX Sys Admin	M & D	ADW/Bachman
TELON COBOL	SYBASE all lvls	ETHERNET	EASEL
FOCUS VM/CMS	POWERBUILDER	DB2/IMS	VAX VMS C
SYBASE DBA	Client Server	UNIX C++	PL/1 CICS DB2
UNIX TESTER	BookMaster	IEF	IDMS

COMSYS
Dept. CW 4 Research Place, Rockville, MD 20850
(301) 921-3600 • FAX (301) 921-3700(fax/line)
800-926-6797
Atlanta • Colorado Springs • Dallas • Denver • Phoenix
Raleigh • Washington, DC
NACCB Member EEO/M/F/H/V

NATIONAL

ATLANTA, GA

BOSTON, MA

CHICAGO, IL

CLEVELAND, OH

DURHAM, NC

MCLEAN, VA

RICHMOND, VA

SAN FRANCISCO, CA

SOFTWARE CONSULTANTS

We're The Registry a dynamic, rapidly growing Software Consulting Company with unique and highly challenging assignments for both Software Engineers and MIS programmers at all levels of experience.

NATIONAL
MUMPS/ PIA
MAC / C++
SQL / VAX / CLINICAL
IDMS / ADSO
ORACLE CASE
VAX/SQL/COBOL FORTRAN
Contact: Dan
(800) 248-8119
FAX: (817) 237-0723

ATLANTA, GA
IBM / SAL / CICS
D&B HR / GL
SYBASE / DBA
VAX / COBOL / RDB
PROGRESS or FOCUS
CA / NETMAN
Contact: Jeff
(800) 235-8119
FAX: (404) 257-0586

BOSTON, MA
POWERBUILDER
VISUAL BASIC
DB2 / TELON
REVELATION
MICROFOCUS COBOL
BACHMAN CASE
Contact: Meredith
(800) 248-8119
FAX: (617) 237-0723

CHICAGO, IL
POWERBUILDER
WINDOWS
MAC APP / MPW
M & D
OS2
UNIX / SCSI / DRIVERS
Contact: Chris
(800) 677-8119
FAX: (312) 558-1380

CLEVELAND, OH
MOD 204
IMS DB / DC
INFORMIX / UNIX / C
BSEE/C++
HOGAN
CICS / DB2
Contact: Chuck
(216) 328-8888
FAX: (216) 328-8330

DURHAM, NC
CICS / DB2
UNIX / C / ORACLE
IEF / ANALYST
VAX / SYBASE
AS400 / RPG III
GUPTA/SQL/WINDOWS
Contact: Chris Blair
(800) 338-8119
FAX: (919) 544-8058

MCLEAN, VA
SAS
ORACLE FINANCIALS
MS - WINDOWS
MUMPS
SYBASE
VMS / C
Contact: Bill
(800) 367-8119
FAX: (703) 790-8467

RICHMOND, VA
AUTO DIALER
DB2 CICS COBOL
IBM / FORTRAN
IMS DB / DC / COBOL
COBOL / VSAM / CICS
UNIX / C / X-WINDOWS
Contact: Susan
(804) 747-1688
FAX: (804) 346-0510

SAN FRANCISCO, CA
ORACLE / FORMS 2.3
PRIMOS SYS PROG
OS2 / PM / C
C++ / X-WINDOWS / LEX
ULTRIX SYS MGR
MS-WINDOWS / C++
Contact: Mike
(800) 248-8119
FAX: (617) 237-0723

The Registry
Member NACCB

Portland, Oregon Consulting Opportunities!

If you are an above-average D.P. professional who likes variety, interesting work, excellent pay, good benefits, and continued career growth -- and you would prefer to live in a safe, beautiful city situated in the middle of the beautiful Pacific Northwest -- then call us!

PDG is the #1 paying, #1 ethical, & #1 performing computer consulting services firm in Portland, Oregon. We are expanding our 60 person consulting staff due to expanding growth in the very healthy Northwest economy. We are trying to fill 22 job openings. Positions require some of the following skills:

- IMS (DB/DC)
- UNIX, X-Windows, C, C++, Sybase
- IDMS, IDD, OLM, ADSO
- VAX, Tandems, PC LANS
- CICS, VSAM, Intertest, BMS
- Case Tools (IEF, IEW, Bachman)
- DB2, SQL, QMF, CSP, SQL/DS
- COBOL, PL/1, OS/MVS, TSO/ ISPF

Hourly and salaried positions available. PDG, 10300 S.W. Greenburg Road, Suite 230, Portland, Oregon 97223. Phone: (503) 293-2499, Fax: (503) 293-3898. Attention: Staff Manager.

INFORMATION SYSTEMS SPECIALIST

To plan and manage information technology applications in a library with an expanding role.

Inquires to:
T. Mark Hodges
Medical Center Library
Vanderbilt University
Nashville, TN 37232-2340
1-800-288-0110
AA/EEO Employer

CONSULTANTS FT
CICS DB2 CSP FOCUS
Adabas Natural
PARADOX SYBASE
COMMANDER SYSTEM W
ULTRIX UNIX C
IBM OEC Data Modeling
your solution is
SAGE SOLUTIONS
Ph 212 714 2599 Fx 714 2558

SENIOR SOFTWARE ENGINEER - 40 hrs./wk., 8am-5pm, $44,500.00 per yr. To analyze, design and develop engineering, insurance manufacturing and networking application systems. Formalize user specifications and evaluate hardware and software required for implementation. Confer with technical engineering staff to resolve problems. Requires Bachelor's Degree in Computer Science, Electrical or Mechanical Engineering, 5 years experience in job offered or 5 years experience as Systems Analyst. Experience must include IBM 3090 CSP, DB2, CICS, CLIST and On-Line systems. Send resumes to 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No: 63192. "Employer Paid Ad."

SALARIED POSITIONS WITH CLIENT COMPANIES & THEIR AFFILIATES NATIONALLY

$30,000-$65,000
- Networks & GUIs/windows
- CASE tools + Relational DBs
- Open Systems + Connectivity
- Imaging + Oper Sys + OSF + AI

Contact Howard Levin
RSVP SERVICES
P.O. Box 8369
Cherry Hill, NJ 08002-0369
(800) 222-0153
FAX (609) 667-2605
Placing professionals since 1968

Hiring Managers

Recruit qualified computer and communications professionals with the *IDG Communications Computer Careers Network* of five leading computer newspapers. For more details, Call Lisa McGrath at:

(800) 343-6474
(in MA, 508/879-0700)

CUSTOMER SATISFACTION STARTS WITH INDIVIDUAL QUALITY.

At Amdahl, we believe that our commitment to quality is the foundation of our success. It is reflected in our customer service rankings and our successful large scale data processing and new open systems products and services.

Within our Corporate Information Systems, the question is how to provide our customers access to the right information...at the right time. We consistently provide the answers at all levels. This means continual challenges for each of us as we push our technology beyond the present state-of-the-art.

At Amdahl, you'll find a corporate culture that encourages you to achieve your best personally and professionally, as well as the resources you need to make quality contributions that truly create an impact.

DATABASE ADMINISTRATORS

The challenge of change and innovation requires the strength of information from multiple sources. As a Database Administrator, you will support multiple DBMS technologies by providing technical consulting and education to Application Developers, DBAs, and Project Managers. In addition, you will draft the standards and processes for DBMS operation and utilization, as well as monitor and advise of DBMS trends. The successful candidate will have a minimum of 6 years of data processing experience with 4+ years of support and maintenance of multiple DBMS technologies. A BS/BA or equivalent experience is required. IDMS or mainframe Oracle experience is preferred.

DATA ADMINISTRATOR

You will conduct both low and high level business analyses, maintain corporate data models and provide project support in a multiple DBMS and multiple operating system environment. To qualify, you must possess a BA/BS or equivalent experience, a minimum of 3 years of project development support including data modeling, data analysis, JAD facilitation, business modeling, as well as 2 years of related experience in an IDMS/Oracle environment. Knowledge of CASE tools, preferably Bachman, and data dictionary or repository experience are essential. A background in the architecture and implementation of relational databases is a plus.

COMPUTER ARCHITECT

As the principal member of the Network Services team, you will design corporate networks to support Amdahl's growing requirements. In addition to defining corporate network strategy, you will provide technical assessment on network product trends, architecture, and planning assistance. A minimum of 9+ years of experience in network design and planning is required. You must possess a BA/BS in a related discipline, or equivalent experience, as well as excellent communication skills and creative problem solving ability.

To be considered for these challenging opportunities, please forward your resume to **Amdahl Corporation, Staffing Department AJL0905, 1250 E. Arques Ave., P.O. Box 3470, M/S 300, Sunnyvale, CA 94088-3470. FAX: 408-746-8287.** Principals only, please. Amdahl Corporation is proud to be an equal opportunity employer through affirmative action. All trademarks are registered to their respective companies.

amdahl

Principal Software Engineer responsible for the design development and analysis of complex software algorithms, implementation of networking protocol standards, testing of network products, introduction of software into manufacturing, improving software quality within the group, development of documentation including specifications, project status reports, technical manuals, product test plans, presentations & leadership. Requirements for this position include a Master of Science degree in Electrical Engineering, Computer Science, or Applied Physics, with a concentration in computer hardware & software. Demonstrated ability in analysis, design & implementation of real-time multi-Microprocessor Based Systems, & complex software systems on UNIX and MS-DOS. Graduate level training in applying Quality techniques including Robust Engineering Design, Design for Manufacturing and Quality Function Deployment to Software is required. High level system programming skills in C, analysis of & programming using Computer Communications Hardware Components. Programming of 8 bit Microprocessors, expertise with the UNIX and MS-DOS Operating System & Technical Writing is also required. 40 hr work week. 8:15 a.m. to 5:00 p.m. Salary $51,459.20. If you are interested in the above position, please forward (2) resumes to Attention: Case #21099, P.O. Box 8968, Boston, MA 02114. No experience required. EOE.

FLORIDA

Sybase C APT	48K
HP3000 COBOL	40K
VAX VMS COBOL DCL	39K
Tandem COBOL TAL	36K
C UNIX MOTIF	48K
CASE Sybase MS Wind	50K
MICROFOCUS COBOL	38K
ASSEM COBOL CICS	42K
IMS DB DC COBOL DB2	38K
C UNIX INFORMIX	40K
HP Speedware COBOL	40K
AS400 RPG COBOL	38K
MAD G L A P	40K
ORACLE 6.0 FORMS 3.0	42K
GIS	35K
IDMS ADSO FOCUS	40K
ADA FORTRAN	39K
OS Z GC Mod	
DISOSS Ov400	44K

COMPUTER BUSINESS ASSOC.

TAMPA

ORLANDO

ANOTHER REASON WHY COMPUTERWORLD RECRUITMENT ADVERTISING WORKS ...

Computerworld gives its readers career updates on today's computer skills and employment issues.

And it does this through special Computer Careers editorial that anchors Computerworld's recruitment advertising section every week. Whether it's informing IBM professionals on their career paths, or updating UNIX experts on what's ahead with their careers, Computerworld delivers the most pertinent and frequent computer career information available in America.

To place your ad regionally or nationally, call John Corrigan, Vice President/Classified Advertising, at **800/343-6474 (in MA, 508/879-0700).**

COMPUTERWORLD
Where the qualified candidates look. Every week.

Heavy travel has future payoff

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest adviser is Steven B. Fogle, a managing director at The Alexander Group, an executive search firm with offices in San Francisco and Houston.

Q I have just taken a job as an electronic data processing (EDP) auditor at a major worldwide consumer products company. I was told before taking the job that there would be travel, but I've been on the road at least 80% to 90% of the time. Is this common?

A Yes. If you can endure at least two years of this pace, it will pay off. You will gain much more exposure to line management, which helps for future career growth. Additionally, I know numerous EDP auditors who have been able to achieve international positions.

Q I am a programmer/analyst. I've always wanted to get into networking, so I got certified as a Novell Enterprise Certified NetWare Engineer (ECNE). I haven't had any luck finding a job as an ECNE, and I can't find a transitional post where I can use my programming or Novell skills. What do I have to do to get into networking?

A Several companies are currently recruiting Novell-certified individuals. There are regional Novell networking groups that should be very helpful to you.

Usually, the most successful way to move into a networking role is to join a company that is active in cross-training and supports employees who would like to develop additional skills.

I recommend that you contact every Novell user in your area to gain a better understanding of the job market and increase your visibility.

FAST TRACK
CAREER ADVICE FOR THE '90s

Q A colleague told me it was a good idea to find an area that complements my regular programmer/analyst-type skills.

What could I tie from my information systems background — that is, the programmer/analyst-type things that I've been doing over the years — with telecommunications?

A Clearly, in large IS organizations, there are programmer/analysts who are part of the telecom departments. Additionally, there are numerous prosperous telecom manufacturers and services companies that are recruiting at all levels in their IS groups.

Recently, I have been aware of an increase in the need for analysts in long-distance aggregation companies (long-distance brokers).

Q I am currently a financial analyst/systems analyst at a large medical center. I am a certified public accountant, but I have recently been involved in major software development and systems projects.

Should I try to move over to the IS department or stay in finance?

A Depending on the organization, your skills would be valuable in either department. I would think that you would have the most opportunity by demonstrating a strong background in both finance and IS. Stay close to the department that is the greater decision maker for the organization.

We want to hear from you. Call your career questions in using the Fast Track line at (508) 820-8522; send them via MCI Mail to KDWYER or send them by fax to Kelly E. Dwyer at (508) 875-8931. Letters may be edited for brevity and clarity. If we use your question, we'll send you a gift.

TIP of the MONTH

How to handle a co-worker who isn't pulling his weight

Find out if the problem is because the person won't or can't do the work. If he won't do it, find out why, and if you think he's being inconsiderate and irresponsible, speak to someone higher up. If he can't do it, teach the person what he doesn't know so he can do it. If that doesn't work, call a meeting with the manager and the individual and explore solutions.

Jerry Weinberger, systems analyst
New York Department of Transportation, New York

Everyone is overworked as it is, and everyone is expected to pull their weight. If someone isn't, tell the manager that it isn't fair to the others and that the employee should be talked to.

Dawn Quitschau, systems analyst
Grand Valley State University, Allendale, Mich.

If a person had pulled his weight in the past, I would see if something was wrong. If he was new, I would show him by example what was expected of him. If there was no improvement, then I would go to the manager.

Joseph Flint, programmer/analyst II
Safeco Insurance, Seattle

I had a case like that and I went to the fellow, offered my help, and advised him to get training. When he wasn't responsive, I went to the supervisor and said I thought the employee could do the work with more training and support. He agreed and asked me to tell the employee. I said, 'I recognized you could use more training, and I mentioned it to the supervisor, who said he would support you.'

Nancy Walpole, analyst III
Portland General Electric, Portland, Ore.

How you handle it really depends on your relationship with the person. Ultimately, if there's no improvement, I would have to write it up and send it to the next level of management.

Mark Albin, project manager
Merrill Lynch, Jersey City, N.J.

SOFTWARE PROFESSIONALS

LEE Int'l, Inc., a worldwide consulting company, has multiple requirements for M&D and MSA Application Software professionals with the following experience and skills:

1. Millennium
2. HR/M, M-AR, M-AP, M-G/L
3. Project Management in Financial and Human Resource Application Systems
4. COBOL, CICS, DB2 and MVS

Please facsimile your resume to 404-924-0347 or mail your resume to:

LEE Int'l Inc.
6050 Peachtree Pkwy
Ste. 340-125
Norcross, GA 30092

We urgently need YOUR help to develop newest, still unreleased prototype of the best Mainframe and Distrib. Processing product line to hit market in years! This product line still has no competition!! POSITIONS NATIONWIDE!!!

CICS * DB2 * VTAM * TPF * SNA * LU6.2 * 3270
RE-ENTRANT BAL * X-MEMORY SERVICES

ROYALTIES * RELO * 40-100K * STABILITY

DEV'S: Work on cutting edge! NO MAINTENANCE!!
SE's: Pre- and post- sales customer support!
QA: Implement test standards, automation!
MGMT: Manage dev's & product direction!

Products include: IMS/DB2 perf. monitors & tools, 3990 storage mgmt, CASE, X-system dev.

PA's & SP's FOR OUR NEW DATA CENTER IN NO. CAL. ONLY:
CICS * DB2 * MSA/ M&D * ADABAS * RACF * ACF2 * DASD

CALL WAYNE CARTER TODAY!!
(800) 938-1550 (408) 241-6044 (213) 658-1550
FAX (408) 241-9684 (213) 658-1570
MODEM (408) 241-0105 (213) 658-1557 (2400 N81)
6300 WILSHIRE BLVD SUITE 1100 L. A., CA 90048

Our Clients Consult With the Best...

GILCOR ENTERPRISES, INC. and your Headquartered in Chicago, we are a national subcontractor to IBM with several exciting projects about to begin in the Midwest. These opportunities require hands-on Technical Consultants on a per project basis. Qualified candidates will possess a minimum of five years experience in one or more of the following areas:

- CASE (Bachman, ADW, IEF)
- SYSTEMS PROGRAMMERS (IMVS, NCP/VTAM, CICS, DB2, IMS, MVM, SMS)
- DATABASE (DB2, IMS)
- P/A (IMS, DB2, SQL, CICS, COBOL, DB2 • C • DB2, C++, SYBASE, UNIX)

Willingness to travel preferred.

If you're the best, please mail or fax your resume with salary history (principals only, please) to:

GILCOR ENTERPRISES, INC.
Attn: Ms. Judy Rutchenreit
2021 Midwest Rd., Suite 200
Oak Brook, IL 60521
Fax: (708) 953-1483
Equal Opportunity Employer

I.E.F.®
MINDBANK
8500 Leesburg Pike, Ste 7800, Vienna, VA 22182
Call Now: 1-800-444-2234
FAX: 703-761-3038
IEF is a registered trademark of Texas Instruments

DALLAS SOUTHWEST

IBM Facilities Planner	$80K
DB2 Product Authors	$90K
Client Server Manager	$88K
IMS/DB2 Product Support	$70K
Banking P/As (to Mgr)	$70K
Tandem Sys. Programmer on Sig 6 P/As (to Mgr)	$63K
C/GUI/Business P/A & Mgr	$63K
Data Modelers	$60K
DB2/Case Appl. P/L	$50K
P/L, IBM mf/Methodology	$50K
AS/400 P/As	$48K
Natural/Adabas P/As	$48K
CICS P/A w/Methodology	$40K
IDMS P/As	$39K
IDEAL P/As	$36K

LA ARÉE Personnel Consultants
12286 Hoel Rd. - Suite 2001
Dallas, TX 75240
Phone (214) 661-9999
FAX (214) 661-1368
In Dallas Since 1970
Member National Computer Assoc.
Affiliates Nationwide

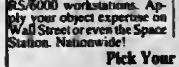
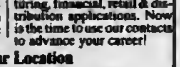
Senior
Programmer Analyst

Production support and project leadership for large corporate payroll processing center in expanding GE business. BS in computer science or related field. 2 to 3 years technical/leadership experience in large scale DP environment. IBM (JCL, TSO, IDMS, ADS/O, COBOL). Salary negotiable, excellent benefits. Send resumes to Professional Staffing P.O. Box 33002, Lakeland, Florida 33807. We are an equal opportunity employer.

C++ Windows OOD
Gain access to advanced SW technology. C++, X Windows, widgets, toolkits. Sun, NeXT, RS/6000 workstations. Apply your object expertise on Wall Street or even the Space Station. Nationwide!

AS/400 Sytex
We have information on over 10,000 AS/400 sites. 1+ yr. RPGIII exp. req'd. Manufacturing, financial, retail & distribution applications. Now is the time to use our contacts to advance your career!

Pick Your Location
Paul Morris Personnel 800-220-1044

CONTRACT PROGRAMMERS
OUT OF STATE RATES UP TO $50 PER HR
Openings in MI, WI, IN, IL, CA, OH, AL, MO and NC

NOMAD*	IMS/DB/DC	SQL/DS/IAS*	ADF or APS
OS/2	AS400	PS/2	IDMS/ADS/O
OCS/DB2*	DEC, VAX, RDB	APF, MOGAN	CORVISION CASE
PRIME 9000	ADABAS	PACBAS	NAT. 2.0, DB2
FOCUS	INGRES C	SAS*	INFORMIX
ORACLE	PC, UNIX	SQL FORMS	C LANGUAGE

*Out of state Contract To Hire positions available.

J.P.S. INC
P.O. Box 690007, Houston, TX 77269
(713) 370-8019 Toll Free (800) 633-0391 FAX (713) 370-8021
No trainees or part-time positions. Equal Opportunity Employer

CTG is your type of company for the 90's

At CTG, the atmosphere is charged with challenge and excitement as we develop quality based breakthrough solutions into the 90's.

Our talented team members are supported by innovative career management system (CMS490) which offers:

- Comprehensive compensation
- Full feature benefits
- Educational opportunities

Second to none is CTG's IQ (Innovations in Quality) program providing the staff member the opportunity to be with a firm that is globally competitive.

CTG is making an impact in the global marketplace by experiencing phenomenal success, therefore creating a diverse array of career opportunities for knowledgeable professionals.

Current opportunities exist for those experienced in the following areas:

Oracle SQL	MICRO FOCUS COBOL	AIX
IMS DB/DC	Information Engineering	CSP
DB2	AS/400 RPG	ADABAS/NATURAL
C/UNIX Windows	Mac Development	MSA
NOMAD	CICS	Model 204
IDMS/ADSO	OS/2, Presentation Mgr.	Teton

Those wanting to make an impact on their career should send a resume to:

Southeast Region Recruiting Manager
Department CW 9/92
100 Colony Square Suite
Atlanta, GA 30361
FAX (404) 870-1555

Midwest Region Recruiting Manager
Department CW 700/92
Suite 200
Cincinnati, OH
FAX (513) 793-6793

Make telephone contact:

1-800-992-5350
Box 8074

Box 7739

DST Systems

Software Development Specialist

2+years experience in "C", OS/2, and Presentation Manager required

Programmer Analyst

2+years experience in COBOL and DB2. CICS is a plus

DST Systems, Inc. is the nation's largest information processor for the financial services industry. Employing 3,500 associates including 700 in DP. DST designs, develops and operates proprietary software systems to provide shareholder information to the mutual fund, insurance and banking industries.

DST is located in Kansas City, a great place to live with the amenities of much larger cities

Call DST's Technical Recruiters Shanna or Dawn at 1-800-874-0174

Fax your resume to (816) 435-8618 or send to:

DST Systems, Inc.
Human Resources
9th floor
1004 Baltimore
Kansas City, MO
64105

Put Your Ingenuity to the Test

Sellmann, Cobb & Bryant, Inc. is not only a management and data processing consulting firm but is also in the business of applying the right people to the right tasks in order to meet the needs of our clients and achieve the results they seek. We are currently looking for individuals possessing any of the following skills to fill PROGRAMMER ANALYST positions in our locations throughout the country.

- PC Experience
- GUPTA
- YELON
- COBOL
- IMS DB/DC
- CICS
- IDMS
- DB2
- CASE TOOLS
- UNIX
- INFORMIX
- UNISYS
- AS400
- S/38
- RPG

Sellmann, Cobb & Bryant, Inc. also offers a comprehensive insurance package, employee stock option plan and a 401K program. Take your first step toward making your career complete by sending or faxing your resume to:

Sellmann, Cobb & Bryant, Inc.
1365 W. Brierbrook Road
Memphis, TN 38138
Fax: 901-754-8463 1-800-221-1640

MTW Corporation

MTW Corporation has exciting permanent and consulting positions immediately available for Programmers and Programmer Analysts with one to three years experience in the following areas:

- COBOL IMS DB DC
- COBOL DB2
- D&B Accounting Packages
- M&D Millenium
- Financial Billing Packages

Please call 1-800-669-9689, fax your resume to 816-471-7918, or mail your resume to: Lori Matthews, MTW Corporation, 2300 Main Street/Suite 790, Kansas City, MO 64108.

UNIX Communications Analyst, Milwaukee, WI, mortgage insurance provider seeks individual to work as specialist for complex programming problems requiring competence at highest technical level all phases software engineering cycle. Duties include: design, develop, administer program software for DOS-UNIX and UNIX-IBM Host connectivity, using appropriate communication protocols; meet with Account Manager, clients to determine needs, boundaries, complexity, priorities of systems development projects, meet with other programming personnel to coordinate communication between hardware platforms; devise algorithms to solve problems; design, code, document program logic for application systems, test programs and system designs, analyze test results, correct problems, review final product with client, assist in system administration, evaluate new software products, configure hardware and software parameters, provide tech. assistance to senior staff on program application problems, assist with training of less experienced staff. Requires: Degree Computer Science/Engineering, B.S. + 3 yrs. experience OR M.S. + 1 yr. experience job offered or computer programming, plus following special requirements for all applicants: 1 yr. work experience each of following (min. 6 months mortgage insurance industry): C, Shell programming (UNIX), system admin. of AT&T (Sys. V) and AIX admin and programming in SNA/LU6.2 on UNIX and AIX TCP/IP stream sockets, named pipes, message queues; X.25, interrupt driven code using Xmodem/Kermit asynchronous communication protocols (DOS), INFORMIX, INFORMIX-NET, SQL programming in ESQL/C; developing user interface screens (Vermont Views with Microsoft/Borland development environments for DOS), X-Windows applications (OSF/Motif) compilers/interpreters (Lex/Yacc); coursework: 3 or each software engineering, operating systems, compiler/interpreter theory, computer hardware, 1 or algorithm analysis/design. Salary $33,744 to $48,360 pr. 37½-hr. work week M-F. Send 2 copies of resume to: Bernice Kimbrough at Milwaukee Downtown Job Service Office, 819 N. 6th St., Milwaukee WI 53203 for Job Order #0556124.

ANOTHER REASON WHY COMPUTERWORLD RECRUITMENT ADVERTISING WORKS ...

Computerworld gives you the unique option of REGIONAL or NATIONAL recruitment advertising.

Whether you want to run your ad in the Eastern, Midwestern, Western, National, or any combination of regional editions. Computerworld gives you the only regional recruitment advertising section available in the United States exclusively for computer professionals. And no other newspaper or magazine reaches so many qualified computer professionals regionally or nationally!

Computerworld's Regional Editions

To place your ad regionally or nationally, call John Corrigan, Vice President/Classified Advertising, at **800/343-6474 (in MA, 508/879-0700).**

COMPUTERWORLD
Where the qualified candidates look. Every week.

INFORMATION SYSTEMS ANALYST

Compares, evaluates and customizes real-time process monitoring and control software packages. Writes software and interface modules for factory floor devices. Writes programs for special CIM project modules. Designs DECwindow-based, object-oriented, graphical monitoring/control applications. Participates in project planning, manufacturing automation process design and computer system capacity planning. Performs plant start up and computer-based shop floor automation system integration. Develops departmental standards for software development. Must have two years' experience with the following: VAX/VMS, PC/MS-DOS, and PDP-11/RSX11M computer systems. C, Fortran DCL, and VMS SYSTEM Services computer languages and relational databases. Must have one year experience with Apple Macintosh computer system. Must have six months' experience in BASEstar, SL-GMS, Datawaves, VXL, Data Flow Manager, Data Table Library, DECWindow, FMS, VAX-SET, All-in-1, and DECNET software packages. Must have six months' experience with the following: ASEA Brown Boveri robots, Allen Bradley PLCs, Allen Bradley pyramid integrator, Allen Bradley Pro-Spec 6000 torque gun controller, Atlas Copco torque gun controller, Data Highway/Data Highway Plus protocol, Intermec bar-code devices and HP protocol analyzer. Must have Master's Degree in Electrical or Mechanical Engineering or Computer Science and 2 years experience in real-time process monitoring and control or Bachelor's Degree in Mechanical Engineering or Computer Science and 3 years experience in real-time process monitoring and control. Salary $3220/month. Send resume to O.J. Regina, Job Service, Job Order #0556341, 8067 W. Taurtonia, Milwaukee, WI 53209

IS PROFESSIONALS

Opportunities abound in the Southeast for talented, experienced (3 year minimum) Programmers, Senior PA's and DBA's. Join our talented staff and work in state-of-the-art environments on challenging projects.

- COBOL, CICS, DB2
- DB2, CSP
- Telon, DB2
- Telon, IMS
- CICS, COBOL, Banking
- VAX, Oracle, SQL tools
- SQL/DS, CICS
- RS6000, Ingress
- M&I Commercial Loan
- M&I Deposit
- CICS, BL/1
- Hogan Project Manager
- VAX, Fortran, Smartstar
- AS400/VAX Trust Accounting

We offer excellent compensation, relocation assistance, full benefit package and education reimbursement. Send your resume TODAY!

AMERICAN COMPUTER PROFESSIONALS
140 Stoneridge Drive
Suite 350
Columbia, SC 29210
800-933-9227
FAX: 803-779-1955
Equal Opportunity Employer

Data Administration Manager

We've created an important new position to help us address the systems needs of our rapidly expanding company. If you're ready for a truly exciting professional opportunity, you'll want to explore your potential with Gander Mountain, a fast-growing retailer and direct mail marketer of outdoor sporting goods.

Reporting to our MIS Director, you will be heavily involved in analyzing our business goals and developing the strategy for leading us to a new information systems architecture. Areas of challenge include establishing data environment controls, dealing with data redundancies and inconsistencies, and creating new data structures. Your work will also cover overall documentation needs and other functions supporting our migration to larger systems.

We are searching for an effective manager, one with at least five years' experience in data administration and the personal traits needed to fill a leadership role. You should also have RPGIII or RPG 400 programming skills and be proficient in data modeling techniques and CASE tools.

This is an exceptional opportunity for individuals with the credentials outlined above. For immediate, confidential consideration please send your resume to Gander Mountain, Inc., Attn: Personnel, P.O. Box 128, Wilmot, WI 53192.

Gander Mountain Inc.

Equal Opportunity Employer M/F/D/V

"A fantastic place to work and live"

We're looking for the EXTRAS

INFORMATION SYSTEMS PROFESSIONALS

Join USA GROUP in Indianapolis, One of America's Fastest Growing Cities

USA GROUP Inc., the nation's leader in educational financial services, processes loans for higher education enabling millions of students to achieve their educational goals.

The Information Services Division of USA GROUP has opportunities for highly motivated individuals to assist in the development of sophisticated information systems. We are looking for the "extras" ... Professionals who have moved on to acquire additional knowledge in the areas of database management, systems development life cycle methodologies and CASE tool technology.

Our State-Of-The-Art Information Services Environment Includes:

*AMDAHL 5890 RUNNING MVS
*IDMS/R database system
*Expert System technology
*Imaging Technology
*Advanced CASE tools such as Knowledgeware's ADW

Current Openings:

*Programmer/Analysts
*Systems Analysts
*Database Analysts

We offer competitive salaries and a top-notch benefits package including a subsidized on-site day care center, on-site fitness center and competitive relocation package. Our campus site in suburban Indianapolis puts you in the heart of one of America's fastest growing employment markets with easy access to major cities like Cincinnati, St. Louis and Chicago.

We look forward to receiving your resume and salary history by FAX or mail to:

USA GROUP

Human Resources/JMS, P.O. Box 6180, Indianapolis, IN 46206-6180
FAX (317) 595-1253
Equal Opportunity/Affirmative Action Employer

Southeast

Computer Consulting Group, fast immediate openings on its southeast consulting staff for talented Programmer/Analysts. We're especially seeking:

- IMS or CICS (BANKING or MANUFACTURING A PLUS!)
- DB-2
- COBOLII
- UNIX SYSTEM MANAGER
- CATIA/CATEGO
- PC Support Specialist

Computer Consulting Group
Contract Professional Services

4109 Wake Forest Rd
Suite 307
Raleigh, NC 27609
1-800-222-1273
FAX (800)736-9123
Member NACCB

PROGRAMMER-ANALYST. Brookfield,WI. HealthMa insurance company seeks individual responsible for functioning of Certificate Assembly System (CAS) (creates, prints, modifies legal insurance certificates). Duties include: Adds new and special products to CAS, updates system with all requested changes, creates all documentation related to CAS, including training/printing materials, cert. assembly procedures, backup, restore, disaster recovery procedures, all system documentation detailing CAS modules and functions, communicates between Sun SPARC I workstation and IBM mainframe/AS400 works with multiple Sun machines on LAN, programs in ProC and UNIX shell utilizing interleaf desktop publishing and Oracle relational database software prints on Kodak printer using Lionheart software, manipulates Postscript print files, ensures all CAS books comply with laws of various states, trains user and MIS operators of system, meets with software vendors to resolve problems and update Sun workstation with latest releases of software, monitors and maintains CAS system and database, responds to and corrects problems as continuous basis, carries message beeper, on-call 24 hrs. weekdays. Requires B.S. Computer Science or MIS plus 2 yrs. experience job offered or as computer programmer, OR M.S. Computer Science or MIS (ABT acceptable), plus following special requirements for all applicants: 1 yr. experience in each of following: C programming, with at least 2 medium-sized projects 3-4 months duration developed in C language (student college coursework acceptable), UNIX operating system programming (part-time paid position acceptable), min. score of 70 in "Computer Programmer Aptitude Battery standardized programming test (at interview). Salary $28,775/yr 37½-hr week, M-F. Send 3 copies of resume to: Gil Martinez at Waukesha Job Service Office, 141 N.W. Barstow Waukesha, WI 53188 for Job Order #0556238.

RPS

ROADWAY PACKAGE SYSTEM

DATA ARCHITECT

ENTERPRISE LEVEL DATA MODEL

An experienced professional is desired to lead the development and implementation of an enterprise level data model for RPS, one of the fastest growing companies in business history.

Join our large MIS organization located in the Northwestern suburbs of Pittsburgh, one of America's most liveable cities, to help set the direction for our international network of computer systems.

We offer excellent compensation and benefits as well as opportunities for personal and professional growth. Qualified candidates are encouraged to send a resume including salary history to:

ROADWAY PACKAGE SYSTEM, INC.
Attn: Technical Services
P.O. Box 108 Pittsburgh, PA 15230

Equal Opportunity/Affirmative Action Employer

INFORMATION SYSTEMS PROFESSIONALS

A Natural Combination For Success

You'd like to work in a challenging, high-tech environment. You'd like to live in a beautiful, serene environment. Then you'd like to join Schwan's Sales Enterprises – a leader in the manufacture and distribution of frozen foods. Based in rural Southwestern Minnesota, Schwan's continued growth and success has created several opportunities in our Information Systems Department.

If you have 2 or more years' experience in any of the following skill areas, we have openings in PROJECT MANAGEMENT, ANALYSIS, and PROGRAM DEVELOPMENT.

- MRP
- Structured Analysis
- COBOL, C or C++
- Relational Data Base
- Windows Application Development
- Manufacturing Control
- Structured Design
- Case Tools
- Unix/Informix
- Graphic User Interface

We're constantly seeking ways to expand and enhance our systems applications. Our people work in a sophisticated setting that demands inventive minds and energetic individuals who enjoy discovering solutions to complex challenges.

We offer a competitive salary/benefits package that includes profit sharing, continuing education, relocation assistance and realistic opportunities for career advancement. The small town setting of Marshall, MN, provides you with an ideal chance to enjoy an affordable lifestyle, a professionally challenging job and a quiet countryside with numerous outdoor activities. For confidential consideration, please send your resume and cover letter to:

SCHWAN'S SALES ENTERPRISES, INC.
115 W. College Drive
Marshall, MN 56258
Attn: Employment Department

Equal Opportunity Employer M/F

Schwan's Sales Enterprises, Inc.

SYSTEMS ANALYST(S) (RACINE, WISCONSIN). Design, Definition and ongoing modification of intracorporate financial/administrative data base for major corporate clients. Conversion of existing COBOL/CICS software to NATURAL and NATURAL 2/ADABAS for mainframe deployment. Consultation with client management to maximize systems efficiency. MON-FRI, 9-5, $45,000/yr. Req: 2 yrs. exp. in job offered. Send two copies of resumes to Dennie Atkins, Racine Job Service Office, 411 7th Street, Racine, WI 53403. Please include job order no. 0556336.

Computerworld recruitment advertising works!

That's because more computer professionals read more recruitment ads in *Computerworld* than in any other newspaper.

For more information or to place your ad, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).

Weekly. Regional. National. And it works.

An IDG Communications Publication

FLORIDA CONNECTION

P/A Unix C Ingres	$43K
Proj. Manager SYNON	$55K
Sr/A Informix SQL/ACL B.S.	$45K
P/A DB2 Telon or CSP	$42K
P/A MVS Cobol M&D	$43K
P/A Unix C Graphics	$35K
P/A's Intergraph GIS	$45K
P/A's Unix C ROMS	$43K
P/A's AS400 S/36 Synon	$45K
P/A MVS AIOM/KBMS	$40K
P/A's VAX Ingres B.S.	$60K
P/A's AS400 RPG/Cobol	$42K

APPLICATIONS PROGRAMMERS

Datacorp Business Systems, Inc. has been awarded several regional contracts, and has immediate full-time salaried positions for application programmer/analysts with exp. in any of the following areas.

- IEF and other Case Tools
- AS/400, RPG
- IBM mainframe with database

Qualified candidates should call

1-800-327-3274

Market Research Analyst I: Write, test, debug, develop, and modify computer applications and programs for use in marketing section of employment benefits division of insurance company including structural data analysis and data validation. Will use SAS langage as well as FoxPro and Lotus 1-2-3 in performance of duties. Requires M.S. degree in Computer Science. Also requires nine months experience in the job to be performed or nine months experience as a Programmer/Analyst. If experience in related field, entire experience must include using SAS to perform data analysis and data validation. Education to include completion of one course in Advance Database Organization and one course in Data Communications. Education to include six months as a Co-Op/Intern or completion of all M.S. thesis in which SAS was used to perform cost analysis and efficiency of sales program including use of Lotus 1-2-3 and Oboes. 8. Hours: 8:00 a.m. - 5:00 p.m. 40 hours per week at $35,000 per year salary. Must have proof of legal authority to work permanently in the U.S. Please send resume to: Illinois Department of Employment Security, 401 S. State St. - 3 South, Chicago, IL 60605, ATTN: Janet Aschenbrenner, Ref #V-L 5765-A. No Calls. 2 copies of your resume required. An Employer Paid Ad

Software/Hardware Engineer: Will design, develop and modify a remote industrial temperature scanner sensing system to be used in heavy industrial production systems. Modifies and develops sensor software system including computer software and embedded microprocessors. Integrates infrared optical remote sensors with electronic hardware and software. Modifies optical sensors using principles of physics as they relate to material radiation to adjust sensor for various wave length produced by materials such as aluminum, steel, glass, paper etc. Will use C language, 80386 Assembly, 386 PC, Novell Network in performance of duties. Requires M.S. degree in Electrical Engineering & Computer Science. Also requires one year experience in the job to be performed or one year experience as a Software Engineer. Education to include completion of a MS project in infrared wave guide studies. Education to include completion of one course in each of the following: Electronic Circuits; Solid State Theory; Optics; and, Software Engineering. If experience in related field, entire experience must be in the design and development of computer systems and appropriate software using signal processing theory using C language. Hours: 8:30 a.m. -5:00 p.m. 40 hours per week at $43,500 per year salary. Must have proof of legal authority to work permanently in the U.S. Please send resume to: Illinois Department of Employment Security 401 S. State St. - 3 South, Chicago IL 60605, ATTN: Marina Counes, Ref #V-L 8133-C. No Calls. 2 copies of your resume required. An Employer Paid Ad.

NEW CAREERS

ADABAS/NATURAL	To $40K
C/SQL Business Appl	To $60K
Dallas • 214 661 2000	
13355 Noel #2000 • TX 75240	
AS 400, Ingres P/As	To $40K
UNIX 5.0, Informix, CASE Tools, ETHR	
Cincinnati • 513 621 6775	
1429 Springfield Pk. 45215	
DB2 for TANDEM Anal/Prgr	To $50K
Oracle Analyst	To $45K
Northampton, PA • 610 865 0925	
4561 W. Walnut St. Ste. 43060	
MVS/BAL Prod. Developer	To $60K
Consult. Rep. (Mid Level)	To $100K
Wauwatosa, IL • 708 885 1757	
414 Plaza Drive, 60559	

National Computer Associates

PROGRAMMER/ANALYSTS & SYSTEMS PROGRAMMERS

FOR CAROLINAS AND SOUTHEAST

Numerous opportunities exist for on-line and database applications P/As as well as systems programmers and DBA's. Fee Paid. Please call or send resume to:

Keith Reichle, CPC
Systems Search, Inc.
203 Heritage Park
Lake Wylie, SC 29710
803/831-2129

(Local to Charlotte NC)

PROGRAMMER/ ANALYST POSITIONS

SYSTEMS PROGRAMMERS

With at least 3 years experience in

- IMS DB/DC, DL/1
- CICS
- NATURAL
- ADABASE
- PL/1
- COBOL
- DB2/SQL
- TANDEM
- VM/MVS
- RPGII/III
- VAX/VMS
- IDMS/ADS/O
- FOCUS
- C LANGUAGE

Please Send Resume to:

MSI Management Solutions, Inc.
1414 South Third Street, Louisville, KY 40208
502-634-1387

World-Class Opportunities

Throughout the U.S.

AGS, a NYNEX® Company, is a recognized leader in the design and implementation of applications and systems software. We employ over 2,500 computer professionals in 50 offices in the U.S., Canada and England.

We currently have opportunities for computer professionals who are eager to begin a world-class career by joining a group of AGS's top performers. Immediate opportunities exist for professionals with at least one year of experience in the design, development and programming of any of the following:

- OS/2, Pres. Manager
- CICS, DB2
- AIX
- SYBASE
- AS/400, SYNON
- POWERBUILDER
- UNIX®, Informix, Oracle
- UNIX, System Architect
- C++, X-Windows
- UNIX, SQL/Windows, GUI
- IMS, DB/DC
- MANTIS/SUPRA

AGS offers competitive salaries, an excellent benefits package including medical and dental coverage, relocation assistance, training, tuition reimbursement, a 401K savings plan and more. Please respond and indicate geographical preference to:

AGS
A NYNEX Company

National Resources Manager
AGS Information Services, Inc.
1139 Spruce Drive
Mountainside, NJ 07092
FAX: 908-654-9794

An Equal Opportunity Employer M/F/H/V *UNIX is a tm of AT&T

Arizona California Colorado Connecticut Delaware Florida Georgia Illinois Indiana Maryland Massachusetts Michigan New Jersey New York North Carolina Ohio Pennsylvania Texas Canada UK

SYSTEMS & COMPUTER TECHNOLOGY

Opportunities with a Growing Industry Leader

As a result of SCT's recent acquisition of Information Associates (IA), our products, services, strategies and synergies have now been combined to provide an even higher level of service to SCT's growing roster of clients. Our full spectrum of information management services and application product solutions (including The BANNER Series and IA Plus) help institutions of higher education and local government conquer their most urgent challenges.

If you are an Information Systems Professional with experience in one or more of the following areas, consider joining our dynamic organization.

- ORACLE
- SQL
- UNIX
- AS400
- DB2
- COBOL
- CICS
- MVS, TSO

Positions are available in Philadelphia, Rochester and other locations nationwide. Management opportunities exist for individuals with proven experience managing applications or technical support groups. Experience with local government or higher education applications would be a definite plus.

Contact our Corporate Headquarters for details: **(800) 441-7247,** or send your resume & salary history to: **John Edwards, Corporate Recruiter, SCT, 4 Country View Road, Malvern, PA 19355.** For further information on career opportunities with SCT, call our **JOB LINE** at **(800) 722-2344.** An equal opportunity employer.

SCT

CONSULTANTS SHOULD CONSULT MIMI

TANDEM
COBOL, PATHWAY,TAL, SCOBOL,C, SQL,X 25
STRATUS
PL1 COBOL,C ON/2
MUMPS
DSM, ISM, MSM, GTM, IBM RISC/6000 M-SQL
Fulltime/Consulting Positions available in the US/ABROAD
STRATEM
800-562-JOBS
TEL (212)867-2910
FAX (212)867-4205
124 W. 30th St. Suite #302
New York, N.Y.10001

HOGAN & AS/400
30 Openings

SAGE CONSULTING SERVICES, INC.
2050 North Loop West, Suite 201
Houston, TX 77018
LIFE INSURANCE CONSULTANTS!
We have immediate openings for Technical Consultants and Business Analysts experienced with Life and Annuities in any of the following systems:
☐ VANTAGE ☐ LIFE/70
☐ LIFE-COMM ☐ CYBERTEK
NOW! NOW! NOW! NOW!
Also needed: Technical Consultants and Business Analysts with Home Service (Debit) experience!
Send or fax resumes today
713/956-9400 FAX 713/956-7172

SMALLTALK
C++
Professionals Needed
IMMEDIATE OPENINGS!!
Houston, Texas
Min 3 Yrs. Experience
RothWell International
Box 270666
Houston, TX 77277
800 256-0541
VOICE (713)541-0100
FAX (713) 541-1167

TAX FREE SAUDI ARABIA

Sunbelt Opportunities

CORPORATE PERSONNEL
3705-320 Latrobe Drive, Box 221720
Charlotte, NC 28222 (704) 366-1000
Attn: Rick Young, C.P.C.

1420 Positions!
PERMANENT & CONTRACT

SPENCER & ASSOCIATES

CASE CONSULTANT

Corporate Information Systems, Inc. (CIS) is a management consulting firm specializing in information systems and technology consulting for the insurance industry. We seek an experienced Project Leader/Analyst with background in information engineering projects using IEF CASE Tool. Consulting assignments in Chicago and SW US locations. Resumes to CIS, 22 E. Dundee, Suite 26, Barrington, IL 60010 Fax 708/304-0165

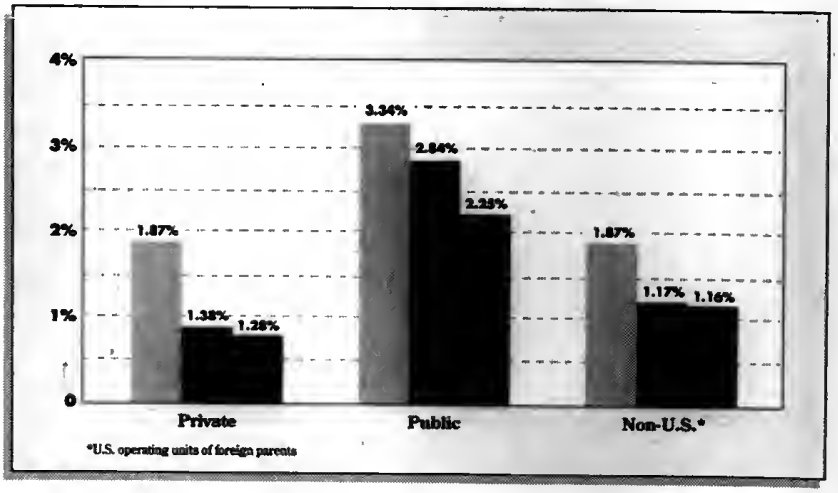
Computerworld/Corptech Career Index

THE BIG PICTURE — Employment changes have been increasing but not at the same rate as last year

Employment change in technology companies by type of ownership

- Change from January 1991 through December 1991
- Change from April 1991 through March 1992
- Change from July 1991 through June 1992

© Copyright 1992, Corporate Technology Information Services, Inc., Woburn, Mass.



*U.S. operating units of foreign parents

A TIME FOR ACHIEVEMENT

Knowledge of data processing and state-of-the-art information systems can help advance the pace of technological achievement in the biomedical sciences. At Glaxo Inc., one of the largest pharmaceutical firms in the U.S., we've created an environment where your individual contributions and cooperative efforts help us advance the pace of technological achievement.

We invite you to experience the challenges and accomplishments a future with us holds for you. The following opportunities are available at our ***Corporate Headquarters located in Research Triangle Park, NC.***

SENIOR DATA ANALYST

Selected individual will design, verify, document, and publish conceptual, logical, and physical data structures and their interrelationships. Duties will include documentation of data custodial responsibilities and procedures, assistance to data custodians to properly manage their data, population of data dictionaries, directories, encyclopedias, etc., and design and documentation of standards and data valuation metrics as required.

Background must include a BS/BA Degree with 6-8 years experience in information processing and 2-3 years hands-on data administration, the last year of which must have been targeted at relational DBMS's (preferably Oracle). Experience in CASE technology also desired, with preferred experience using Oracle's CASE products. Light 4GL programming skills and exposure to Microsoft Windows environment also advantageous. ***Please refer to Job # 3646B014-CW on all resumes.***

WORKSTATION TECHNOLOGY SPECIALISTS (2 Openings)

Selected individuals will be responsible for evaluating, implementing, and supporting advanced network technologies, desktop computing technologies, operating systems, and related products. Both positions require a BS/BA with a minimum of 5 years relevant experience

- *One position is focused at and requires knowledge of* ***Digital's networking architecture****, Pathworks, advanced operating systems (OS/2, VMS) and industry standard Desktop Computing platforms.* ***Please refer to Job # 3646B009-CW on all resumes.***
- *One position is focused at and requires knowledge of industry standard* ***Desktop Computing platforms*** *(Intel-based and Motorola-based), advanced operating systems (DOS 5, System 7, OS/2) and LAN-based computing environments.* ***Please refer to Job #3646B010-CW on all resumes.***

Join Glaxo and enjoy excellent salaries, flexible benefits, an on-site fitness center, a spirit of enthusiasm and teamwork and outstanding opportunities for career satisfaction. Equally appealing is our world-famous scientific, industrial and academic community in Research Triangle Park, NC. Send your resume, ***INDICATING THE CORRESPONDING Job # and salary history, to: Human Resources Department, Glaxo Inc., P.O. Box 13398, Research Triangle Park, NC 27709.*** *(No Phone Calls or Agency Referrals, Please.) An Equal Opportunity Employer M/F/D/V.*

Glaxo Inc.

CHALLENGE

make a difference

At Eli Lilly and Company, the only status-quo is change. Our commitment to innovative thinking has led to the development, manufacture and marketing of some of the world's most progressive products in the areas of pharmaceuticals, medical devices, diagnostics and animal health. With a direct presence abroad for over 70 years, and sales outside the U.S. now accounting for nearly 1/3 of our $5+ billion in revenue, we're strongly positioned to take on the challenges of a growing global market.

We recognize the strategic role that information technology plays in enabling us to achieve a competitive edge. As a result, we are looking for career-oriented individuals to initiate and guide the research and deployment of information technology in scientific, medical, manufacturing, and business systems. If you have a BS or MS degree, 3+ years of experience and are up to the challenge, we invite you to consider joining our staff of more than 600 systems professionals. We are currently looking for:

Data Analysts

Requires experience in the use of an information engineering approach. Knowledge of CASE technologies, such as ADW or IEW, is desirable.

Database Administrators

Requires a minimum of 2 years experience as a DBA in ORACLE or DB2 environments combined with 5+ years of systems development experience. Expertise in performing physical design is required.

Microcomputer Consultants/ Information Resource Center Analysts

For both Windows and Macintosh environments. Requires experience in Local Area Network deployment and administration with ability to select, test and implement workstation software in an office setting.

Systems Analysts

Requires application development and support experience in IBM (DB2 or IMS), DEC (ORACLE) or HP environments. Experience in developing GUI and object-oriented applications in a client server environment is a plus. Knowledge of scientific or medical applications is especially desirable.

Systems Programmers

IBM 3090 VM/XA and MVS/ESA environments.

VAX Systems Managers

Networked VMS systems.

Telecommunications Analysts

Requires technical expertise in design and management of DEC and IBM network environments, including DECNET/ETHERNET, SNA, Token Ring and TCP/IP. The ability to design, implement and support client server architecture is also in demand.

Eli Lilly and Company offers competitive compensation, extensive development programs, and a superb work environment. We will reimburse reasonable moving expenses for those who join us at our corporate headquarters in Indianapolis, Indiana. Indianapolis is an active, growing city offering an excellent quality of life and an affordable cost of living, as well as broad-based cultural, recreational and sports activities.

For prompt consideration, qualified applicants should send a cover letter and resume to: Eli Lilly and Company, Corporate Recruitment - Systems, Dept. CW992, Lilly Corporate Center, Indianapolis, IN 46285.

We are an equal opportunity employer committed to diversity in the work place.

Lilly

CMS Computer Management Sciences, Inc.

Computer Management Sciences, Inc. is an employee-owned, customer driven consulting firm whose strong growth has created many opportunities for MIS Professionals with experience in the following skills.

CICS/DLI • AS400/COBOL • UNISYS/XGEN • IMS IEF: BAA through Construction • ORACLE • DB2 • SYNON • CICS • M&I Commercial Loans • IDMS/ADSO

We not only employ the best technical people, but those technical people with a strong work ethic and the highest level of professional integrity.

Contact Corporate Recruiting:

HARTFORD	ATLANTA	JACKSONVILLE
203-723-1729	800-771-2674	800-725-2674
203-723-1739(FAX)	404-435-8184(FAX)	904-737-6376(FAX)

Computer Management Sciences, Inc.
8133 Baymeadows Way • Jacksonville, FL 32256
904-737-9955
EOE/M/F/H

IEF CONSULTANTS

Nationally established client base with long term assignments (6 months - 3 years). Business Process Redesign & Quick Win (RAD). Image Processing. Outsourcing.

Fax resume or call

CHRISTOPHER
LOGAN/BRITTON

9330 LBJ #600	3300 So. Gessner #150
Dallas, TX 75243	Houston, TX 77063
1-800-362-4361	1-800-362-4362
FAX 214-437-0663	FAX 713-266-0363

Senior Systems Analyst

Statistical programming and consulting company requires a senior project manager to manage projects and plan analysis as well as supervise integrated database development, software development, data analysis and report preparation. Responsibilities include preparation of statistical reports for submission to FDA, as well as design implementation of remote data entry systems and computer aided new drug approvals. M.S. degree in Computer Science or Statistics and two years statistical consulting experience in the pharmaceutical industry is required. Knowledge of computer hardware and software including expertise in SAS, demonstrated ability to design and implement database management and data analysis software and experience in performance of statistical analysis on pharmaceutical data also required. 40 hours per week. Salary: $50,000 per year. Send resume with salary history to T. Moore, Kentucky Job Service, KY #916142, 300 S. Upper St., Lexington, KY 40508 EOE

PDC | PERFORMANCE DEVELOPMENT CORPORATION

Information Engineering / CASE
Client Server / Systems Integration
Relational DBMS

PDC has provided major corporations professional information systems consulting and training services for over twenty years. During that time our focus has remained fixed on assisting our clients in the utilization of advanced technology in the development of strategic information systems.

If you have solid experience in any of the above fields and want to be part of an organization with hundreds of satisfied clients, where you're recognized as a valuable resource and encouraged to grow, mail or fax your resume to:

PERFORMANCE DEVELOPMENT CORP.
5430 LBJ Frwy., Suite 1600 / Dallas, TX 75240
Phone 214-490-9913 / Fax 214-490-1875

Offices in: Princeton, NJ; Los Angeles, CA; Dallas, TX; London, U.K.

ORACLE VMS, UNIX, or MVS
TANDEM Cobol, Scobol, Pathway Tal, C, Unix
CASE TOOLS IEF, IEW Construction
IBM MAINFRAME DB2, CICS, VSAM IMS, DB/DC and DB2 CICS, IMS DB, Cobol AIC, DB2 and CICS
UNIX C, X-Windows, GUI C, INFORMIX, SQL

WE SET THE STANDARD OF EXCELLENCE

In Florida and now nationwide. Offering both Permanent Placement and Consulting opportunities.

COMPUTERPEOPLE, Dept. 525

5285 Meridian Parkway Suite 122 Ft. Lauderdale, FL 33331 305-384-0999 1-800-777-8801 "Serving South Florida & Jacksonville"	12225 28th St. N St. Petersburg, FL 33716 813-573-3626 1-800-329-3626 Fax 573-1153 "Serving the Tampa Bay area"	20 North Orange Ave Suite 1400 Orlando, FL 32801 407-236-9788 1-800-299-9073 "Serving Orlando"

COMPUTERPEOPLE

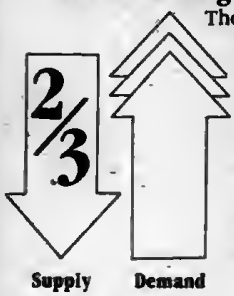
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

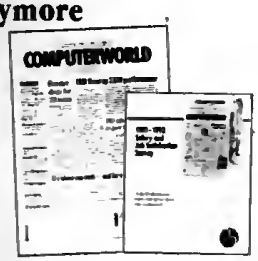
The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore

That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)



For every 10 of today's computer job seekers . . .
2 are Active
7 are Passive
1 is a Non-mover

In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

More job seekers see your ad in Computerworld than in any other newspaper — Sunday, daily, or trade

That's because *Computerworld* reaches over 629,000 qualified computer professionals every week — the largest audience of its kind, and one that's rich with passive and active job seekers.

That's why more companies advertise more jobs in *Computerworld* than in any other professional newspaper. And why *Computerworld* is the *single place* where America's computer professionals *expect* to see the most jobs every week.

Computerworld gives you regional editions

A key option when you need a regional candidate and want to avoid national response and relocation. Yet if your search is national in scope, *Computerworld* can also give you more widespread national exposure than any other source.

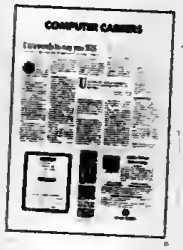
Computerworld needs just 2 working days for your ad to appear

That's comparable to most local newspapers. And why your ad can quickly appear in the next issue to start generating quality response.

Computerworld costs no more than local papers

And with a regional rate of just $182.95 per inch, your cost-per qualified candidate reached is better than any newspaper - Sunday, daily or trade. Or just about any other source, for that matter.

Computerworld leads candidates to your ad

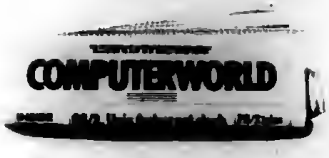


Just look at this week's Computer Careers section. You'll find a career editorial topic that will stir the interest of virtually any computer job seeker — passive *or* active. It's just one of countless reasons *Computerworld* is America's newspaper of choice on computing. No matter how much the times change.

And while times may change, some things won't. Whether you *use* computers, *make* computers, or sell products and services *for* computers, *Computerworld* is still your major source of news today. And your major source of computer professionals tomorrow.

For more recruiting tips, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

NOW REGIONAL



RECRUITS THE BEST!

RECRUITMENT ADVERTISING
Where the qualified candidates look. Every week.

1-800-343-6474 x201

375 Cochituate Rd, Framingham, MA 01701, Fax 1-508-875-3202

Weekly. Regional. National. And it works.

YES, I want to receive my own copy of COMPUTERWORLD. I accept your offer of $29.95* for 39 weekly issues — only 76¢ per issue.

First Name MI Last Name

Title Company

Address

City State Zip

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: $48 per year

* U.S. Only. Canada $74.97. Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
10 Manufacturer (other than computer)
20 Finance/Insurance/Real Estate
30 Medicine/Law/Education
40 Wholesale/Retail/Trade
50 Business Service (except DP)
60 Government - State/Federal/Local
65 Communications Systems/Public Utilities/Transportation
70 Mining/Construction/Petroleum/Refining/Agric.
80 Manufacturer of Computers, Computer-Related Systems or Peripherals
85 System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90 Computer/Peripheral Dealer/Distr./Retailer
95 Other _____ (Please specify)

2. **TITLE/FUNCTION** (Circle one)
IS/MIS/DP MANAGEMENT
19 Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22 Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt., LAN Mgr., PC Mgr.
23 Dir./Mgr. Sys. Development, Sys. Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Mgt.
80 Sys. Integrators/VARs/Consulting Mgt.
CORPORATE MANAGEMENT
11 President, Owner/Partner, General Mgr.
12 Vice President, Asst. VP
13 Treasurer, Controller, Financial Officer
DEPARTMENTAL MANAGEMENT
51 Sales & Mktg. Management
70 Medical, Legal, Accounting Mgt.
OTHER PROFESSIONAL MANAGEMENT
86 Educator, Journalists, Librarians, Students
90 Other Titled Personnel

3. **IS INVOLVEMENT** (Circle all that apply)
Please indicate your involvement in IS/MIS/DP
A Manage/Supervise IS/MIS/DP Staff
B Recommend/Specify IS Equipment
C Purchase IS Equipment
D End-user of IS Equipment
E No Involvement

E4237-7

YES, I want to receive my own copy of COMPUTERWORLD. I accept your offer of $29.95* for 39 weekly issues — only 76¢ per issue.

First Name MI Last Name

Title Company

Address

City State Zip

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: $48 per year

* U.S. Only. Canada $74.97. Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
10 Manufacturer (other than computer)
20 Finance/Insurance/Real Estate
30 Medicine/Law/Education
40 Wholesale/Retail/Trade
50 Business Service (except DP)
60 Government - State/Federal/Local
65 Communications Systems/Public Utilities/Transportation
70 Mining/Construction/Petroleum/Refining/Agric.
80 Manufacturer of Computers, Computer-Related Systems or Peripherals
85 System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90 Computer/Peripheral Dealer/Distr./Retailer
95 Other _____ (Please specify)

2. **TITLE/FUNCTION** (Circle one)
IS/MIS/DP MANAGEMENT
19 Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22 Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt., LAN Mgr., PC Mgr.
23 Dir./Mgr. Sys. Development, Sys. Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Mgt.
85 Sys. Integrators/VARs/Consulting Mgt.
CORPORATE MANAGEMENT
11 President, Owner/Partner, General Mgr.
12 Vice President, Asst. VP
13 Treasurer, Controller, Financial Officer
DEPARTMENTAL MANAGEMENT
51 Sales & Mktg. Management
70 Medical, Legal, Accounting Mgt.
OTHER PROFESSIONAL MANAGEMENT
86 Educator, Journalists, Librarians, Students
90 Other Titled Personnel

3. **IS INVOLVEMENT** (Circle all that apply)
Please indicate your involvement in IS/MIS/DP
A Manage/Supervise IS/MIS/DP Staff
B Recommend/Specify IS Equipment
C Purchase IS Equipment
D End-user of IS Equipment
E No Involvement

E4237-7

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-4144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-4144

The economics of leasing

BY ALICE BREDIN
SPECIAL TO CW

If you're like many people, money is tight for you, and you're reluctant to commit to a technology platform that may prove outdated in the long term. The conditions seem ripe for leasing rather than buying. Especially with lower-than-ever percentages, you may be tempted to take this route. But before you do, be sure you understand the factors that can influence your decision.

Will you keep the equipment for less than five years?

The economic viability of leasing is tied into how quickly technology will be turned over within a company. If it is critical to keep moving with an architectural change, it makes sense to lease. "It also makes sense for people who are in a large rollout phase like point-of-sale," explains Scott Stein, director of desktop computers at Technology Investment Strategies Corp. (TISC) in Framingham, Mass. "Many of our clients will lease for a two- or three-year project that has an end in sight for which they need specific technology for a short term."

If you plan on keeping the equipment for five years or less, it makes economic sense to lease, says Greg Carroll, president of Washington, D.C.-based Computer Leasing and Remarketing Association.

"Making payments for five years or less will save you money. After five years you might pay the same or more as you would to purchase," Carroll says.

Will you need to upgrade?

It is important to negotiate for upgrades when drawing up a lease. Although the cost of upgrading is roughly the same whether you're leasing or buying, terms are negotiated between lessors and users.

The first tip is to know the meaning of the term "upgrade" in your lease. Some lessors will try to substitute enhancements for true upgrades. Some will upgrade by swapping out a group of processors, which is very time-consuming for the user. Still others will consider a new frame on a system an upgrade, says Susan Gannon, a senior analyst at TISC.

If your company is committing to a specific product upgrade, negotiate it into the price up front. "Some vendors will offer a low leasing price, hoping to make it up on the upgrade later on," explains Tom Martin, owner of Computer Financial, Inc., a Hackensack, N.J.-based computer lessor.

You will get a better deal if you negotiate a price in the beginning. "It may be more expensive once upgrading is included, but you will be getting a good deal overall," Martin says.

There are several choices for upgrade fees: a cap arrangement in which a lessee pays only a certain percent of the upgrade or a right to go out for bids at upgrade time, with the lessor given a chance to bid.

"We recommend that customers look at all the competition. If you bring in alternatives, you will keep every vendor honest," Gannon says.

How will you negotiate maintenance?

As a user, you are responsible for maintenance fees. One way to get around paying a big lump-sum maintenance fee is to roll it into the lease so you're making payments on it.

Maintenance runs about 1% to 3% of the purchase price each year. For example, a water-cooled 9021 Model 340, which costs $2.5 million, would cost $4,000 per month to maintain.

Personal computer lessees may skip the maintenance agreement altogether if the machine is under 5 years old. "In the PC area, it is safe not to have [a maintenance agreement] if the machine is new," said Bob Tate, a product manager at ATT Capital, a Dallas-based rental and leasing firm.

From whom will you lease?

Third parties always offer a good price because they have to compete with vendors. "Good price" means beating the manufacturer's rate. "Third parties have to slice a percentage off the vendor's price," Gannon explains.

Third parties may appear to have better prices at first, but that doesn't mean they offer the better deal. Vendors tend to offer more market-basket items that add to the value of a deal in soft-dollar items. These can cut 10% to 15% off the lease price in the form of software, warranties, education allowances and deferred payments.

In addition, they offer financing for weak credit because in general, they have more financial strength than third parties.

Bredin is a free-lance writer based in New York.

Lease or buy?

PC

Product: A new Apple Macintosh II CI

Cost of 12-month lease (at $168 per month): $2,016 ● **Purchase cost:** $2,800 - $2,900

You would have to lease the machine about 1½ years before hitting the purchase cost.

Mainframe

Product: A used IBM 3090 600J

Cost of 24-month lease (at $95,000-$100,000 per month): $2.28 million - $2.4 million ● **Purchase cost:** $2.7million - $2.8 million

You would have to lease the machine for just over two years before hitting the purchase cost.

*Numbers are average

Source: ATT Capital, Technology Investment Strategies Corp. CW Chart: Janell Genovese

Buy/Sell/Lease

REFURBISHED USED
• UPS SYSTEMS
• STANDBY GEN SETS
• LIEBERT A/C
• ACCESS FLOORING
Computer Site Technologies Inc.
262 S. Military Trail
Deerfield Beach, FL 33442
1-800-226-0784
305-425-0638

WANTED: Used Macs!
• We buy, sell, lease and repair Macs
• We buy, sell, lease and repair IBM
RENTEX

WE BOUGHT IBM
By the Thousands
Computer Marketplace has bought and sold thousands of IBM systems, tape drives, disk drives, printers and peripherals. We are interested in offering top dollar for your RISC System/6000, AS/400 or System/36.
SYSTEMS & RENTALS
■ RISC System/6000™ Systems
■ Memory & Features
■ AS/400™
■ Network Solutions
■ System/36
■ PS/2
PERIPHERALS
■ Controllers
■ Disk Drives
■ Tape Drives
■ Memory Options
■ Modems
■ Displays
■ Printers
BUY • SELL • RENT
5 Offices To Serve You!
COMPUTER MARKETPLACE
(800) 858-1144
(714) 735-2102 FAX (714) 735-5717
205 East 5th Street, Corona, CA 91719
RISC System/6000, AS/400 & PS/2, System/36 are trademarks of IBM

DEMPSEY. WHERE IBM® QUALITY IS SECOND NATURE.
• SERIES/1
• 9370
• RS/6000
• INDUSTRIAL PC
• ES/9000
• AS/400
• SYSTEM 36/38
• POINT OF SALE
BUY–LEASE–SELL
• Processors
• Peripherals
• Upgrades
For preleased equipment, flexible financing, configuration planning, technical support and overnight shipping call
(800) 888-2000.
Dempsey BUSINESS SYSTEMS
Where IBM Quality Is Second Nature
CDLA
18377 Beach Blvd., Suite 323 • Huntington Beach, CA 92648 • (714) 847-9466 • FAX (714) 847-3149
IBM
Authorized Remarketer Program
Integrator
IBM is a registered trademark of International Business Machines Corporation

Buy/Sell/Lease

TAKE NO RISK ON RISC SYSTEM/6000

Choose: DATATREND

RISC System/6000 Hardware: Complete systems, upgrades, trades, peripherals, parts
RISC System/6000 Services: Series/1 to RS/6000 Migration, AIX Support/Consultation, Application Re-engineering, Consolidation Services, Data Conversion Services
RISC System/6000 Engineering: Custom Re-configuration, Refurbishment, Complex Systems Integration, Cable Systems Design/Installation, Field Installation, Board Level Repair, Project Packing Services, Configuration Documentation

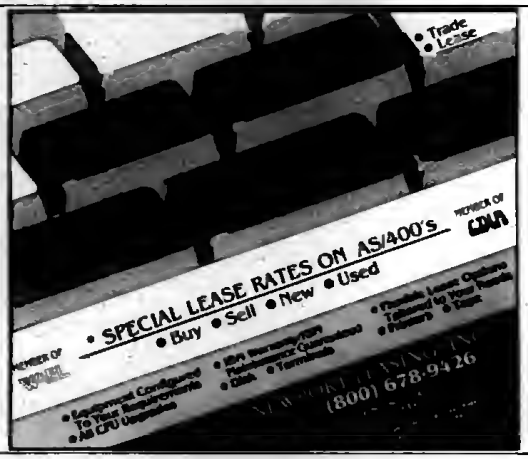
Enterprise Services
Enterprise-wide planning, Host Connectivity, Process Control, RDBMS Incorporation, Complex Systems Integration, Network Solutions, DAE Incorporation

BUY • SELL • LEASE
Series/1
System 36/38
AS/400
937X, 4300, 468X
PS/2, Industrial PC

Datatrend...
IBM Business Partner
IBM Industry Application Specialist
IBM Subcontractor
IBM DAE Enabler
IBM Account Team Partner

Call the "Reliability Company"
1-800-FOR-RISC
(1-800-367-7472)
612-942 9830
10250 Valley View Rd., Suite 149, Eden Prairie, MN 55344

REMEMBER...
Datstrend is also *World Leader* in Series/1
CDLA



New/Reconditioned Digital Equipment

Whatever your requirements are for Digital Equipment, call CSI first! Buying, selling, trading, leasing, consignments - we do it all!

CSI sells all equipment with a 30 day unconditional guarantee on parts and labor and is *eligible for DEC maintenance.*

Offering systems, disk drives, tape drives, printers, terminals, memory, options, boards, upgrades and many more

Distributors Wanted

CSI Computer Systems, Inc.
83 Eastman St.
Easton, MA 02334
1-800-426-5468
In Mass. (508) 230-3700
FAX (508) 230-8150

WE BUY
- Data General
- Sun
- Data Products
- HP
- PC Equipment

...AND WE SELL IT TOO!

(617) 982-9664
FAX
(617) 871-4456

SPECTRA
The complete computer equipment dealer
(714) 970-7000 (800) 745-1233 (714) 970-7095 FAX
BUY • SELL • RENT • LEASE
New & Used: *Processors Peripherals Upgrades*

IBM
ES/9000, 9370, 4381
AS/400, RS/6000
SYSTEM/88
Point of Sale
Banking
CAD/CAM

sun, Prime, UNISYS, XEROX
Digital, Stratus, Hewlett Packard, amdahl, TANDEM
...and more!

ANAHEIM CORPORATE CENTER 5101 E. LaPalma Ave., Anaheim, California 92807

9370/9221?
EXECUTIVE INFOSOURCE!
BUY
SELL
LEASE
MOST MACHINE FEATURES and PERIPHERALS IN STOCK
Telephone: (708) 215-9370
Fax: (708) 215-9992 CDLA

Over 629,000 computer professionals read Computerworld weekly.

COMPUTERWORLD
Product Classified Pages
Examine the issues while computer professionals examine your message.
Call for all the details.
(800) 343-6474
(In MA., 508/879-0700)

Bids/Proposals/Real Estate

Information Offering

The City of New Orleans, LA is making information available to prospective vendors regarding needs for Financial Management System (FMS) and Human Resources (HR) application software.

The applications must provide for all financial accounting, and personnel management requirements of a local government entity including:
- General Ledger, Budgetary Accounting & Formulation
- Purchasing & Inventory Management
- Grants, Programs, & Projects Accounting
- Accounts Payable & Receivable
- Capital Assets Accounting
- Management Control & Reporting
- Payroll & Compensation Management
- Pension & Benefits Management
- Position Control & Applicant Tracking

The applications must be capable of running on the available hardware platform (IBM 9121 Model 210 MVS/ESA 3.1 and DOS 3.1)

A Business Model of anticipated areas of implementation is being offered to prospective vendors. It contains:
- Areas of implementation
- Definition of current business processes
- Problem definitions
- Improvement possibilities
- Required inputs and outputs

A Request For Proposal (RFP) is anticipated for release in the fourth quarter of 1992. This model and any contact with firms for additional information are for planning purposes only and do not obligate the City to issue a solicitation or award a contract. No expenditures are authorized as a result of this announcement.

To receive a copy of the Business Model, please send product literature to the extent of above mentioned qualifications and a non-refundable check for $200.00 payable to the City of New Orleans, LA to: Bruce Woods, 1300 Perdido Street, Room 9E01, New Orleans, LA 70112

REQUEST FOR BIDS

Racal-Datacom is accepting bids for lots of used data communications equipment. We're clearing our warehouse of excess and used inventory...everything from dedicated modems and muxers to X.25 pads. Thousands of products are numerous to list.

To receive a list of equipment available, write or call:

James Gaddy
Racal-Datacom
1601 North Harrison Parkway
Mail Station C210
Sunrise, FL 33323-2899
(305) 846-4571

NOTE: Closing date for bids will be noon EST, October 9, 1992.

BIDDER MAILING LISTS – The Financial Information Services Agency of the City of New York ("FISA"), a large mainframe service bureau, has established a number of categories of bidder lists for (i) Data Processing goods and services in all areas of hardware, software, maintenance and consultant services, and (ii) other categories of goods and services which may be procured by the agency. FISA is now inviting applications from the vendor community for inclusion on its bidder lists. A Comprehensive listing of FISA's Bidder Lists Categories, Applications for Inclusion on Bidder Lists and further information can be obtained by writing to the FINANCIAL INFORMATION SERVICES AGENCY, 111 8th Ave, New York, N.Y. 10011, Attn: Mike Neves, Area 10B.

COMPUTERWORLD
Product Classified Pages
give you buyers with extensive purchase influence.

In fact, a full 95% are involved in purchase decision making for their organizations. They determine needs, evaluate technologies, identify solutions, and select products and vendors for the entire range of information systems, as well as related products and services.

So if you're selling computer products and services, advertise in the newspaper that delivers buyers with volume purchasing influence. Advertise in *Computerworld's Product Classified Pages!*

For more information, call
(800) 343-6474
(in MA, 508/879-0700)

COMPUTERWORLD
PRODUCT CLASSIFIED
Where computer buyers meet computer sellers. Every week.

Education/Training

CALL NOW FOR...
Dr. James Martin's
Video Education Courses on:

- [illegible]
- [illegible]
- "ADE Techniques & Methodology"
- [illegible]
- [illegible]

For your FREE James Martin Insight Courseware Catalog on Diskette

Call 1-800-526-0452
JAMES MARTIN INSIGHT INC.

X / Motif
C C++
MS-Windows
UNIX OOP
Classes scheduled in Dallas & San Jose also on-site training
Texas SW / Clarity
214 - 272 - 6962

COMPUTERWORLD
Product Classified Pages
Examines the issues while computer professionals examine your message. Call for all the details.
(800) 343-6474
(In MA., 508/879-0700)

Your used computer equipment deserves a second chance.

If you have used computer equipment to sell, *Computerworld's Product Classified Pages* are the best place to do your selling. That's because *Product Classified* features a Buy/Sell/Lease section to help you market your equipment to the very people who are looking to buy.

And when you advertise in *Computerworld's Product Classified Pages*, you reach a total (ABC-audited) audience of over 629,000 computer professionals who turn to *Computerworld* for news, information, features - and the *Product Classified Pages* - every week.

So give your used computer equipment a second chance today. To reserve your space, call:

800/343-6474
(in MA, 508/879-0700)

COMPUTERWORLD
Where computer buyers meet computer sellers. Every Week.

ALICOMP, INC.

The "Boutique" of the Computer Services World

VM, MVS, VSE
Outsourcing
Timesharing
Consulting
Remote and On Site
Serving Clients Since 1980
(212) 886-3600
an affiliate of Amalgamated Life

Keeping your competitive edge was never easier...

if you rely on CSC CompuSource for outsourcing support.

Other vendors sell large systems, plenty of MIPS and UPS systems and software. That's it. CSC offers important advantages like minimum risk with maximum cash flow. And the ability to provide total solutions that put you in control of your bottom line.

So if you're looking for someone to run your jobs – with a commitment to quality and client satisfaction – count on CSC CompuSource.

CSC
CSC CompuSource
A Company of Computer Sciences Corporation
110 MacKenan Drive
Cary, North Carolina 27511
919.481.9341

REDUCE OPERATING EXPENSE WITH OUTSOURCING FROM NYNEX.

- ❑ IBM MVS and VM in a CICS Environment
- ❑ Full Complement of Systems Software
- ❑ Database Support Including DB2
- ❑ Remote Computing
- ❑ High Speed Laser Printers
- ❑ Intelligent Inserters and Direct Mail Capabilities
- ❑ Network Administration and Management
- ❑ Service Level Guarantees

For further information call: 1-800-545-9876

NYNEX.
NYNEX Computer Services Company
Two Blue Hill Plaza, Pearl River, N.Y. 10965

Product Classified Pages
Where America's Computer ProfessionalsShop
(800) 343-6474
(in MA; 508/879-0700)

REMOTE COMPUTING
OUTSOURCING
TIMESHARING

COMPUTER RESERVES will
- Nationally search for all platforms.
- Match your exact specifications.
- Locate multiple vendors.
- Help negotiate the lowest price.

1200 placements in 25 years.
Never a charge to the buyer because our fee is paid by the seller.
CALL DON SEIDEN
1 800 882-0988 NJ 201 882-9700

REMOTE COMPUTING • OUTSOURCING

• MVS/ESA	• QMF	• IMS/DBDC
• MVS/XA	• CICS	• VM/370
• DB2	• TSO	• DOS/VSE

OVER 150 SOFTWARE PRODUCTS
• DEVELOPMENT • DEBUGGING
• PRODUCTIVITY • PERFORMANCE

• TELENET • TYMNET
• SEARSNET • IBM INFORMATION NETWORK

EXTRAORDINARY CUSTOMER SERVICE
MIGRATION MANAGEMENT

GIS INFORMATION SYSTEMS INC
819 Commerce Drive, Oak Brook, IL 60521
708-574-3636 New England 617-595-8000

USE OUR TECHNOLOGY TO YOUR FINANCIAL ADVANTAGE

Hundreds of Large and Small Companies Gain a Competitive Advantage by Using Comdisco's Nationwide Remote Computing, Information Technology Sourcing and Global Data, Voice and Video Network.

Featuring:
- IBM® CPUs and Peripherals
- Full Range of Systems Software
- Database and Applications Software Support
- Technical & Financial Planning
- Disaster Recovery
- Service Level Guarantees
- Capacity & Platform Transition Planning
- Financial Asset Management

Call: Bob Marino
800-227-6584
COMDISCO®
COMDISCO COMPUTING SERVICES CORP.
450 Gotham Parkway
Carlstadt, NJ 07072
(201) 896-3011

FREE COMPUTER OUTSOURCING GUIDE

Start your vendor evaluation process with our FREE Vendor Evaluation Guide.

Make your outsourcing decision more confidently and a great deal easier with our simple evaluation system. You could save weeks of time, thousands of dollars and avoid costly oversights if you start your evaluation process with this comprehensive and easy to use guide. This FREE guide incorporates over 150 criteria for choosing an outsourcing partner in an easy to use PC spreadsheet format or hard copy.

Whether you're just beginning the evaluation process, are well into the process or are changing your current outsourcing provider, this FREE guide will help you make the right decision.

Call us direct at 708-719-0247, or Fax your business card to: FREE Guide 708-719-0447.

May & Speh, inc.
1501 Opus Place - Downers Grove, IL 60515-5713

Remote Computing

MVS and VM Environments
- Facilities Management
- Consulting & Programming Support
- Functional Outsourcing

PRC
Strength Through Understanding

Achieving Excellence in Customer Service for 25 Years

Call us at
1-800-531-5489
for a flexible, cost-effective solution, custom tailored to meet your needs.

PRC Inc., 1500 PRC Drive, McLean, VA 22102

PRODUCT CLASSIFIED PAGES
Where America's Computer Professionals Shop
(800) 343-6474
(in MA; 508/879-0700)

ORACLE
OUTSOURCE
Your Project to Oracle Masters
CASE Tools Financials
Ak,Unix,C,VMS,OS/2,Cobol
Authorized Oracle VARS
Executive Technologies
813-732-5242
813-732-5097 Fax

$22 Hr. or $1.50 line
Applications Development
- CICS/DB2/IMS/COBOL
- AS/400: COBOL/SQL
- PC: 4GL/COBOL/C

Free Quote. Excel. References. 12 yrs in business. 70 P/As & S/As.
CCD Online Systems
Call David Lee
1-800-328-6755

OUTSOURCING, REMOTE COMPUTING, NETWORK MANAGEMENT SERVICES

- IBM MVS/XA Environment
- DB2, IDMS/R, Model 204, CICS and 4 GLs
- Professional Support Staff
- Experienced Migration Management Team
- Flexible Charges, Custom Solutions To Meet Your Needs
- AS/400, Asset
- Support Services
  - -Media Conversion
  - -Laser, LED & Impact Printing
  - -Application Programming
- Network Management Services LAN/WAN/MAN/SNA/PBX
- Technical Support
- 24 Hours Per Day - 7 Days Per Week

May & Speh, inc.
1501 Opus Place - Downers Grove, IL 60515-5713
1-800-729-1501
For More Information Contact: Tony Ranieri

Product Showcase

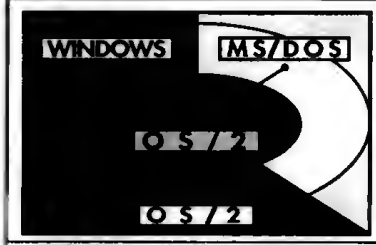
FAX = SCANNER

Enables Your FAX MACHINE to Become a SCANNER

Features:
- Word processor compatible
- Mouse compatible
- Phone book for easy fax dialing
- User friendly
- Edit graphics, images, photos, and text
- Include all tools for a laser quality fax
- Folders for filing faxes and name cards
- Full page scanning

FXSCAN ONLY $79.95

TO ORDER: 1-800-949-1292



TRUE CLIENT-SERVER E-MAIL SYSTEM

TOSS/LAN under OS/2 is a complete e-mail system for Netware, Vines or OS/2 LANs. End users can be on OS/2, DOS or Windows. A SNADS interface is provided to communicate with DISOSS, SoftSwitch, AS/400 and other e-mail systems. E-mail, Scheduler, Bulletin Boards, Forms, and Folders are all included in the system.

NBS Systems, Inc.
15 Mullen Road, Enfield, CT 06082
Tel: 203-741-2244
Fax: 203-745-5030

The multiple PC backup solution is as easy to install as it is to use. System plugs directly into parallel printer port of your computer without use of controller cards or special adapters. One backup system can be used for every PC in your office. Fast backup – up to 12 Meg/Min – 160 meg storage, 60/120 and 600/1200 Meg systems available November. MS/PC-DOS compatible, network NODE compatible. Menu-driven software. Full on-line help.

Analog & Digital Peripherals, Inc. (ADPI)
(513) 339-2241
FAX: (513) 339-0070

MVS QUICK-REF

gives you access to a concise summary of over one million lines of IBM and 3rd party MVS reference information in less than two seconds. For a free 30-day trial call...

ChicagoSoft
603-643-4002

Cost Effective Inventory and Help Desk Software

The **INVENTORY** program is a comprehensive software package that manages computer assets and purchases. The **DATA CAPTURE** software automates the data collection task for the inventory module. The **TROUBLE LOG** program allows users to track and resolve support calls and inquiries while logging common problems. Full reporting capabilities and utilities are included. Multi-user Network version and source code are available.

ConsulNet Computing Inc.
51 Paperbirch Dr., Don Mills
Ontario, CANADA, M3C 2E6
1-416-441-0363
Fax: 1-416-449-1985

ELECTRONIC COMPUTER GLOSSARY

Get the Word Out!

Spread COMPUTER LITERACY and INTERNAL STANDARDS to every PC user, beginner or expert. Start with our award-winning 5,000 definitions and DOS help. Add your own terms. Site licenses for DOS and Windows start at $250. Everyone loves it!

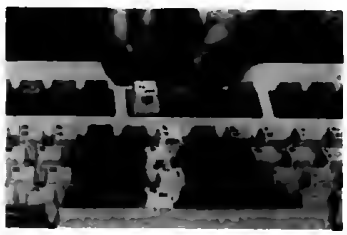
The Computer Language Company Inc
5521 State Park Road
Point Pleasant, PA 18950
1-215-297-5999
Fax: 1-215-297-8424

DRILL THROUGH MARKETING RHETORIC WITH ACTION ORIENTED ANALYSIS

From Computing to Networking

Gartner Group, the premier information technology advisor to the "Fortune 1000," is pleased to announce the immediate availability of 14 research reports, 4 newsletters and 12 audio tape series covering the key issues of the changing information technology industry. For a **FREE** copy of **The Challenges and Benefits of Client/Server Processing**, or **Network Computing: The Next Five Years**, call

GartnerGroup
1-800-677-7778
or (203) 967-6855



Complete Keyboard Customizing

Featuring: Custom Key Imprinting
Full Color Keyboard Templates
Keytop Overlays • Language Keyboards
P.O.S. Keys • Custom Keyboards

Training, productivity & marketing solutions!

Hooleon Corp.
P.O. Box 230, Dept. COMW
Cornville, AZ 86325
Free Catalog
800 937-1337
Fax: 602 634-4620

Computerworld's Product Showcase Sells Your Product

Just ask Duane Amari, Vice President of Marketing for Pro/Sim. According to Duane, "... 50% of all leads generated by our Computerworld Product Showcase advertisements are quickly converted into sales."

For more information, please call:

800/343-6474

PLACE YOUR PRODUCT IN:

COMPUTERWORLD'S PRODUCT SHOWCASE!

For just $2,700, your product can appear 3 times in COMPUTERWORLD's PRODUCT SHOWCASE.

To place your message, or for more information, just fill out this form and fax it to (508) 620-7739. Or place your advertisement by calling (800) 343-6474

COMPUTERWORLD

Name Of Your Product

Your product can appear here and all week Computerworld's 429,284 readers. Place your message today.

ABC Company 1-800-000-0000

4 COLOR PHOTO or Graphic

PREFERRED 4- COLOR MATERIALS: 4-color negatives, right reading emulsion side down. Acceptable also (in order of preference to maintain optimum reproduction quality) are: 4-color transparencies; 35mm color slides; color photos.

If 4-color artwork is not available, Computerworld will assist Product Showcase advertisers in the development of appropriate graphics for their advertisements.

Ad width: 3", Ad Depth: 3 1/2" Photo width: 2 3/4"; Photo depth: 1 3/4".

SALES OFFICES

Associate Publisher/Senior Vice President Sales
Kevin McPherson

BOSTON: Vice-President Eastern Advertising Sales/David Peterson, Sr. District Managers/Bill Cadigan, Sherry Driscoll, District Manager/John Watts, Sales Assistants/Alice Longley, Lisa Bonaccorso, Linda Clinton, COMPUTERWORLD, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX: (508) 872-2915

CHICAGO: District Manager/Charles Boyd, Sales Assistants/Karol Lange, COMPUTERWORLD, 10400 West Higgins Road, Suite 300, Rosemont, IL 60018 (708) 827-4433 FAX: (708) 827-9159

NEW YORK: Senior District Manager/Fred LoSapio, District Managers/Paula D'Amico, Rich Molden, Sales Assistant/Susan Kusnic, COMPUTERWORLD, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090 FAX: (201) 712-9786

LOS ANGELES: Southwestern Regional Manager/Fran Cowen, Sales Assistant/Judi Taylor, COMPUTERWORLD, 18008 Sky Park Circle, Suite 145, Irvine, CA 92714 (714) 261-1230 FAX: (714) 250-4681

SAN FRANCISCO: Vice-President Western Advertising Sales: Richard Espinoza, Executive Assistant, Leticia Cicino, Senior District Manager/Ernie Chamberlain, District Managers/Michele Gerus, Kaye Sharbrough, Sharon R. O'Brien, Sales Assistants/Candace Cera, Bonnie Chin, Tami Cormier, Diana Moon, COMPUTERWORLD, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-8312

ATLANTA: Senior District Manager/Bernie Hockswender, Sales Assistant/Debra Brown, COMPUTERWORLD, 1400 Lake Hearn Drive, Suite 330, Atlanta, GA 30319 (404) 394-0756 FAX: (404) 255-5123

DALLAS: Southeastern District Manager/Darren Ford, Sales Assistant/Brenda Shipman, COMPUTERWORLD, 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (214) 233-0882 FAX: (214) 385-1603

WASHINGTON, D.C.: District Manager/Paula D'Amico, COMPUTERWORLD, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090 FAX: (201) 712-9786

CUSTOM PUBLICATIONS:
Vice President/Larry Craven, Director of Publishing Services/Carolyn Novack, Sales Assistant/Heidi Schuberthan, FAX: (508) 879-0446

CLASSIFIED ADVERTISING SALES:
Vice President/Classified Advertising/John Corrigan, Marketing Director/Derek E. Hurlzky, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, In MA (508) 879-0700

PRODUCT CLASSIFIED ADVERTISING:
East: Account Manager/Paul Bonengo, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, In MA (508) 879-0700

West: Account Executive/Bill Cresnte, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, In MA (508) 879-0700

RECRUITMENT ADVERTISING SALES OFFICES:
New England: Regional Manager/Nancy Percival, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, In MA (508) 879-0700, Account Executive/Karen Leslie, (800) 343-6474, In MA (508) 879-0700

Mid-Atlantic: Regional Manager/Valerie Gallo, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090, Account Executive/Caryn Dietz, (800) 343-6474

South-Atlantic: Regional Manager/Katie Weiss, 8304 Professional Hill Drive, Fairfax, VA 22031 (703) 573-4115, Sr Account Executive/Pauline Smith (800) 343-6474

Midwest: Regional Manager/Pat Powers, O'Hare Corp. Ter I, 10400 W. Higgins Rd., Ste. 300, Rosemont, IL 60018 (708) 827-4433, Senior Account Executive/Ellen Casey (800) 343-6474

West: Regional Manager/Barbara Murphy, 18008 Skypark Circle, Ste. 145, Irvine, CA 92714 (714) 250-0164 Senior Account Executive/Christopher Glenn (800) 343-6474

DIRECT RESPONSE CARDS:
East: Account Manager/Norma Tambunino, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090

West: Account Executive/Jill Green, 18008 Skypark Circle, Ste. 145, Irvine, CA 92714 (714) 250-0164

IDG INTERNATIONAL MARKETING SERVICES:
President/Frank Cutitta, Eastern Advertising Manager/Veronique Lamarque, 187 Oaks Road, Framingham, MA 01701 (508) 879-0700

Western Advertising Manager/Ginny Rohman, 180 Harbor Drive, Suite 215, Sausalito, CA 94965 (415) 331-7571 FAX: (415) 332-0778

CW PUBLISHING, INC.

An IDG Company: The World's Leader in Information Services on Information Technology

Gary J. Beach
CEO & Publisher

Computerworld Headquarters, 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171
Phone: 508-879-0700, Telex: 95-1153, FAX: 508-875-4394

Bill Laberis	Kevin McPherson	Matthew Smith	Steve F. Wolf
Senior Vice-President Editorial	**Associate Publisher Senior Vice President/Sales**	**Senior Vice-President Operations**	**Senior Vice-President Marketing**

FINANCE Controller, John St. Martin

PUBLISHER'S OFFICE Executive Assistant to the CEO/Publisher, Karen Elliott

SALES - DISPLAY Advertising Director, Carolyn Novack. Display Advertising Production Manager, Maureen Hanley

SALES - CLASSIFIED Vice President Classified Advertising, John Corrigan. Classified Marketing Director, Derek E. Hurlzky. Classified Operations Director, Cynthia Delany

MARKETING Director, Marketing Communications, Mary Doyle. Account Manager, Marketing Communications, Elizabeth Phillips. Manager, Trade Show & Conventions, Audrey Shohan. Marketing Communications Project Coordinator, Susan Thaxter. Administrative Assistant, Patty Faherty

CIRCULATION Vice-President Circulation, Gail Odenkirk. Director of Circulation Management, Maureen Burke.

PRODUCTION Production Manager, Beverly Wolff

DISTRIBUTION Distribution Manager, Robert Wescott. Traffic Manager, Pat Walker.

SYSTEMS Director of Information Systems, Linda Nelson.
Administrative Sales Assistant, Lois Bennett

GLOBAL LEADERSHIP NETWORK

FOREIGN EDITORIAL/SALES OFFICES

ARGENTINA: Ruben Argento, IDG Communicaciones S/A, Av. Belgrano 406, Piso 9, Of. 1092 Buenos Aires. Phone (011) 541 342 5883 Telex: (390) 22644 (BAZAN AR). FAX: (011) 541 331 7672

ASIA: S.W. Chan, Sea Computerworld Communications Ltd., 701-4 Kam Chung Bldg., 54 Jaffe Road, Wanchai, Hong Kong. Phone: (011) (852) 861 3238. FAX: (011) 852 861 0963

AUSTRALIA: Don Kennedy, IDG Communications Pty Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (011) 61 2 439-3133. Telex: (790) 4474752 (COMPAC). FAX: (011) 61 2 439 3912.

AUSTRIA: Manfred Weiss, IDG Communications Österreich, Leonardo Zeughofgasse 6, A-1070 Wien, Austria. Phone: (011) 43 222 523 18 310. Telex: (847) 115542 (SCH/A). FAX: (011) 43 222 523 08 25.

BRAZIL: Vey Knet, Computerworld do Brasil Ltda., Rua Fonseca, 16/28 Andar (20081 904 do Janeiro, RJ Brazil. Phone: (011) 55 21 240 8225. Telex: (391) 21 30862R BR. Sao Paulo, Computerworld do Brasil Ltda., Rua Joaquim Floriano, 466/3 Andar CEP 04534, Sao Paulo, Brazil. Phone: (011) 55 11 852 3636. Telex: (391) 21 30838 (IDGW BR). FAX: (011) 55 21 286 7758

COLOMBIA: Clara Mateus, Computerworld Colombia, Transversa 23 No. 98-35, Bogota, Colombia. Phone (011) 571 310 0106. FAX: (011) 571 211 2946

DENMARK: Preben Engel, IDG Danmark A/S, Vandtaarnsvej 4, DK 2500 Valby, Denmark. Phone (011) 45 36 442800 Telex: (855) 31886. FAX (011) 45 36 442830

FRANCE: Pierrette Choussinoux, IDG Communications France, Immeuble La Fayette, 2, Place des Vosges, La Defense 68, 92051 Paris la Defense, France. Phone: (011) 33 1 4904 7800. Telex: (842) 613204F. FAX: (011) 33 1 4904 7800

GERMANY: Erhard Ulzheimer, IDG Communications Verlag AG, Pharmacenter 26/28, Postfach 40 04 29, 8000 Munich 40, Germany. Phone: (011) 49 89 360890. Telex: (841) 521950 (COMA D). FAX: (011) 49 89 3 60 86146.

HUNGARY: Istvan Bin, IDG Communications Hungary Rodolfo Ltd., 1018 Budapest, Gellerthegy u. 30-32 Postal address H-1530, Budapest, P.O.B. 394 Hungary. Phone: (011) 36 1 138 9122 Telex: (861) 226307 (Rolfo H). Fax: (011) 361 / 252 6989

INDIA: Rohini Khullar, Media Transasia India Ltd., 105 Antop Hill, Taw Delhi (110045, India. Phone (011) 91 11 Tele (011) 91 11 643 2892.

ITALY: Brunello Sosio, IDG Communications Sosio, Via Mecenate 90/14, 20138 Milano, Italia. Phone: (011) 39 2 58 01 16 60. Telex: (843) 335316 FAX: (011) 39 2 58 01 16 70

JAPAN: Jim Flood, IDG Communications/Japan, Kyodo 1001 Bldg. 6F, No. 618, 5-1 Kojimachi, Chiyodaku Tokyo 102 Japan. Phone: (011) (81 33 222 0411 Telex: (781) 252 4217. FAX: (011) 81 33 222 0668.

MEXICO: Hanry Morales, Computerworld Mexico S.A. de C.V., Barranca de Cabras #30, Col. Colinas de San Javier, 53 000 Mexico D.F. Phone: (011) 52 5 576 4454, Telex: (883) 177 1835 (ANAME) FAX: (011) 52 5 576 1140

THE NETHERLANDS: Roel Bakker, IDG Communications B.V. Lomanweg 1-7P.O. Box 1346, 2004 LS/2000 BB Haarlem, The Netherlands. Phone (011) 31 23 888 614 Telex: (844) 74042 (CWCOM NL) FAX: (011) 31 23 324 184

NEW ZEALAND: Marion Taylor, IDG Communications Ltd., 2nd Floor 15 Augustus Terrace, Parnell, Auckland 1, New Zealand. Phone (011) 64 9 779 992. Fax (011) 64 9 774 058

NORWAY: Morten Hansen, CW Norge A/S, Kjeldsrudv 43, 0676, Oslo 6, Norway. Phone (011) 472 387725. Telex: (856) 76470 CW N/ISM NL. FAX: (011) 47 885 6165

PEOPLE'S REPUBLIC OF CHINA: Shen Yan, China Computerworld, 7A Lu Gu Road, Suite 702, Beijing 100039, People's Republic of China. Phone (011) 861 81 8044. Telex: (716) 222214 (CCW CN). FAX: (011) 861 831 7899

RUSSIA: Boris Jurkovic, Information Computer Enterprise, Prospekt 685 167-66-22. USWK, prospekt 94, 129523 Moscow, USSR (C.I.S. Phone: (011) 509 5 497 8300. Telex: (871) 441 SSA. FAX: (011) 709 5 185 8899

SINGAPORE: S.W. Chan, Sea Computerworld Communications, 04-01 Thomson Building Centre, 541 Orchard Road, Singapore 1 5AA, Republic of Singapore. Phone (011) 65 345 4383. Telex: (789) RS 37000 (Comtech). FAX: (011) 65 345 7087

SPAIN: Paco Zabala, IDG Communications, S.A., Rafael Calvo 18, 4B, 28010 Madrid, Spain. Phone (011) 34 1 319 8014. Telex: (832) 49522 (CM E). FAX: (011) 34 1 319 0178

SWEDEN: Bengt Mjovinsson, CW Communications AB, Sveavagen 24, 22, S-115 49, Stockholm, Sweden. Phone (011) 46 8657 9180. Telex: (854) 19909 (IDGNOS) FAX: (011) 46 8658 3130

SWITZERLAND: Hubert Gronostaj, CW Publikationen AG, Stampfenbachstrasse 15, Postfach 263, CH - 8090 Zurich, Switzerland. Phone (011) 41 1 207 77 77. Telex: (845) 816710 (CWC) CH). FAX: (011) 41 1 201 1185

TAIWAN: Harry Yen, IDG Communications/Taiwan, 11F-5, No. 127, Section 1, Fu Hsin Street, Taipei, Taiwan 10599, Taiwan, R.O.C. Phone: (011) 886 2 721 4302 FAX: (011) 886 2 777 5339.

UNITED KINGDOM: Ian Thomlinson, CW Communications Ltd., 30 Gray's Inn Rd., London, WC1 8LU (mailing address). Phone: (011) 44 71 831 8252. FAX: (011) 44 71 972 0271. Colin Smith, Grant Smith & Partners, Ltd. 19 Abbeville Mews, 88 Clapham Park Road, London SW4 7BX Unit 88 Kingdom. Phone: (0) (11) 88 71 978 1440. FAX: (011) 44 71 978 1580.

VENEZUELA: Kathryn von Hone Nagy, IDG Communications C.A. Telex: Montalbán, Rdo I.3, Oficina H, Av. Universidad Caracas, Venezuela. Phone: (011) 58 2 73 73 30. FAX: (011) 58 2 7734976.

INTERNATIONAL DATA GROUP, INC.

Patrick J. Mcgovern, Chairman | Walter Boyd, Chairman Executive Committee | William P. Sturdivant, Vice President, Finance | Robert Madell, Vice President

ADVERTISERS INDEX

Andersen Consulting	84-85
Applied Business Technology	80-81
AT&T	81
AT&T Business Communications Services	22-23, 60-61
Bachman	106
Bertand International	32/33
British Telecom North America	95
Cabletron Systems	39
CANAC Telecom	42
Candle Corp	21
Chipcom	96
Cincom Systems	40
Cisco Systems	C3
Cognos	58
Compaq Computer Corp	74-75, 100/101
Compuserv	93
Computer Associates	5, 83
CW Circulation	85
CW Marketing	59
CW Recruitment	38, 60, 66, 73, 77, 91, 113
Data General	84
DCA	112
Dexpo	110
Dow Jones Services	113
EDIA	95
EDS	62-63
Emerging Technology Applications	57
Genicom	77
Hewlett-Packard	18-19, 38
Information Builders	86
Informix	C4
Integris	80
Interface Group	114
Intersolv	92
Landmark Systems	64
Laser Data	37
Legent Corp	102-103
Lexmark	65
Lotus Development Corp	34, 70-71
Micro Focus	11
Microsoft	29
Multi-Tech Systems	15
Napersoft	79
NCR	30-31,104
Oracle Corp	7, 9
Platinum Technology	79
Q-Star Technologies	76
SAP America	108
SAS Institute	17, 36
Soft-Switch	95
Software 2000	10
Software AG	25
Sterling Software	56, 66
Sybase, Inc.	13
Symplex	24
Syncsort	9
3M	72-73
Tandem	47
Texas Instruments	88-89
Toshiba America	26-27
TSI International	52/53
Unisys	61
Universal Data Systems	111
VMark Software	82
WHITE PAPER	41-56
Workstation Group	107
XDB Systems	35
Xircom	60

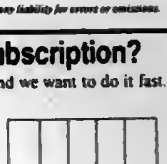
This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Have A Problem With Your Subscription?

We want to solve it to your complete satisfaction, and we want to do it fast. Please write to:

COMPUTERWORLD, P.O. Box 2043, Marion, Ohio 43305-2043.

Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and coded line as it appears on your label. Send this along with your correspondence.



Address Changes or Other Changes to Your Subscription

All address changes, title changes, etc. should be accompanied by your address label, if possible, or by a copy of the information which appears on the label, including the coded line. Please allow six weeks for processing time.

Your New Address Goes Here

Name _____

Company _____

Address _____

City _____ State _____ Zip _____

Address shown: ☐ Home ☐ Business

Other Questions and Problems

It is better to write us concerning your problem and include the magazine label. Also, address changes are handled more efficiently by mail. However, should you need to reach us quickly the following toll-free number is available:

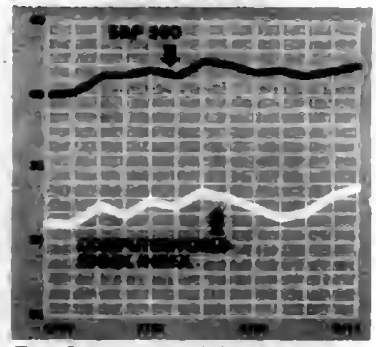
1-800-669-1002

Outside U.S. call (614) 382-3322

COMPUTERWORLD

P.O. Box 2043, Marion, Ohio 43305

STOCK TRADING INDEX



Industry Almanac

NEW COVERAGE

INITIAL RATING OF BUY: **Autodesk, Inc.** (Salomon Brothers, Inc.). Autodesk (ACAD) roars in with the lion's share — nearly 70% — of the personal computer-based, computer-aided design software market, led by AutoCAD, its flagship offering. Earlier this year, the company rejuvenated its management team with three new top-level officers. Autodesk said it will concentrate on research and development across a breadth of products.

INITIAL RATING OF BUY: **Banyan Systems, Inc.** (Alex. Brown & Sons, Inc.). Banyan (BNYN) completed an initial public offering last month of 2.67 million shares at $10.50 per share. Since then, Banyan has kicked off an "open" Unix versioo of Vines, the company's network operating system, with a version for **The Santa Cruz Operation**'s SCO Unix. Previously, Vines operated solely with a proprietary versioo of Unix created by Banyan. The company plans to announce a new product tomorrow that is expected to enable other vendors network operating systems to work with Banyan's Enterprise Network Services.

INITIAL RATING OF BUY: **ChipSoft, Inc.** (The Chicago Corp.). ChipSoft (CSFT) is a major player in the professional tax preparation software market. Strong annoal growth is expected in the long term because. ChipSoft sells both Microsoft Corp. (MSFT) Windows and Apple Computer, Inc. (AAPL) Macintosh versions of its software.

RECOMMENDATION CHANGES

UPGRADED FROM SELL TO HOLD: **Compaq Computer Corp.** (Mabon Securities Corp.). Compaq's (CPQ) supply problems appear to be subsiding. Specifically, the company miscalculated demand for its ProLinea line and was forced to add more manufacturing sites to accelerate delivery of disk drives, power supplies and flat-panel displays. Also, a PC indostry shakeout that could erupt during the next six months should benefit Compaq. Companies such as **Advanced Logic Research, Inc. (AALR), Everex Systems, Inc.** (EVRX), **Zeos International Ltd.** (ZEOS) and other clone vendors may be completely pushed out of the business. If Compaq can attractively position its brand-name image for price-sensitive segments of the market, it should be able to pick up some of the residual busioess left by the clone makers.

LISA DAVIDSON

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, SEPTEMBER 11, 1992

TOP PERCENT GAINERS

Maca Software	22.73
IPL Systems Inc.	20.93
Network General	50.00
PictureTel Corp	16.18
Comtex Computer (L)	16.50
Information Resources	17.44
AST Research Inc.*	17.31
Xilinx	16.31

TOP PERCENT LOSERS

Radius Inc.	-34.46
Struct. Dynamics Research (L)	-30.00
Cray Computer	-17.24
Go Video	-13.04
Pyramid Technology	-12.31
Ross Systems	-11.86
Wang Labs Inc. (B)*	-11.19
Computer Task Group	-9.09

TOP DOLLAR GAINERS

Progress Software Corp.	4.38
Borland Int'l Inc.*	3.88
Information Resources	3.75
Sybase Inc.	3.75
Cadetron Systems	3.75
Parametric Technology (H)	3.88
CompUSA Inc.	3.88
Sun Microsystems Inc.*	3.25

TOP DOLLAR LOSERS

Matsushita Electronics	-5.50
Struct. Dynamics Research (L)	-4.50
Radius Inc.	-2.50
Adobe Systems Inc. (L)	-2.38
Southwestern Bell Corp.	-1.63
Nynex Corp.*	-1.63
US West Inc.	-1.38
Bellsouth Corp.	-1.25

Exch	52-Week High	52-Week Low		Sept. 11 Close	Wk Net Change	Wk Pct Change
Communications and Network Services						Up 3.50%
OTC	15.00	9.00	3COM Corp.*	13.63	1.63	13.54
NYS	70.63	56.25	American Info Techs Corp.*	67.63	-1.13	-1.64
NYS	44.88	32.88	AT&T*	43.75	1.38	3.24
OTC	4.38	0.88	Ariel Communication Corp	0.88	0.00	4.72
NYS	49.75	40.25	Bell Atlantic Corp	46.63	-0.50	-1.02
NYS	46.50	43.38	Bellsouth Corp.	52.25	-1.25	-2.34
NYS	8.25	3.75	Blair, Banaseik & Newman	4.50	0.13	2.86
NYS	55.88	39.63	Cabletron Systems	63.00	3.75	6.33
OTC	31.00	17.50	Chipcom Corp	25.50	0.50	2.00
OTC	53.75	16.63	Cisco Systems Inc.	53.38	3.13	6.22
OTC	35.25	5.75	Compression Labs Inc.	7.50	0.25	3.45
OTC	3.38	0.88	Data Switch Corp	1.63	0.00	0.00
NYS	23.63	13.38	Digital Comm. Assoc.*	14.88	-0.88	-5.88
OTC	15.25	6.00	Digital Systems Int'l Inc.	6.63	0.38	4.05
OTC	9.25	3.63	DSC Communications (H)	9.75	0.00	0.00
OTC	10.88	4.75	Fibronics Int'l Inc.	5.63	0.00	0.00
OTC	37.50	10.50	Fibronics Int'l Inc.	13.50	-0.25	-1.83
OTC	3.88	1.13	Gandalf Technologies Inc.	2.13	0.13	6.25
OTC	2.25	0.88	Gateway Communications	1.69	0.13	8.00
NYS	5.50	2.25	General Datacomm Inds.	3.63	0.50	16.00
ASE	5.88	0.50	Go Video	2.50	-0.38	-13.09
NYS	88.75	28.75	GTE Corp.*	33.13	-0.38	-1.12
NYS	70.63	50.00	ITT Corp.	54.63	-1.25	-1.50
OTC	38.13	22.25	MCI Communications Corp.	35.25	1.25	3.68
OTC	14.50	2.25	Microcom Inc.	3.63	0.00	0.00
NYS	19.25	6.50	Network Equipment Tech.*	11.88	0.88	7.95
OTC	25.50	8.00	Network General	12.00	2.00	20.00
OTC	14.00	6.50	Network Systems Corp.	12.38	1.13	10.00
OTC	17.88	5.63	Newbridge Networks Corp.	16.38	-0.25	-1.50
NYS	89.25	33.75	Northern Telecom Ltd.*	35.00	0.00	0.00
OTC	65.00	32.50	Novell Inc.*	54.13	2.88	5.61
OTC	98.38	68.13	Nynex Corp.*	82.75	-1.63	-1.93
OTC	37.50	19.50	Octel Communications Corp	22.75	1.00	4.60
OTC	9.88	4.00	Penril Data Comm. Ntwks.	5.50	0.63	12.82
OTC	53.00	10.25	Picturetel Corp.	14.75	2.38	19.19
OTC	19.75	8.75	Proteon Inc.	15.00	1.00	7.14
NYS	29.13	11.63	Scientific Atlanta Inc. (H)	29.13	1.88	6.89
NYS	88.50	53.75	Southwestern Bell Corp	80.75	-1.63	-2.41
NYS	38.38	50.75	Sprint Corp.	23.00	0.13	0.55
OTC	15.13	4.00	Standard Microsystems Corp(H)	15.13	1.63	12.04
OTC	40.63	14.25	Synoptics Communications (H)	40.63	2.25	5.86
NYS	40.00	22.88	US West Inc.	38.13	-1.38	-3.49
OTC	41.88	24.00	Wellfleet Communications	41.88	2.63	6.68
PC and Workstations						Up 3.13%
OTC	14.50	4.50	Advanced Logic Research	4.50	-0.25	-5.26
OTC	70.00	42.75	Apple Computer Inc.*	47.63	0.88	0.75
OTC	32.25	11.25	AST Research Inc.*	15.25	2.25	17.31
NYS	19.25	6.75	Commodore Int'l	8.00	-0.50	-5.88
NYS	85.75	22.13	Compaq Computer Corp.*	32.88	0.38	1.15
OTC	29.00	13.91	Dell Computer Corp	25.50	1.50	6.00
OTC	7.75	2.00	Everex Systems Inc	2.00	-0.13	-5.88
NYS	34.00	21.25	Harris Corp.	31.38	1.63	9.86
NYS	69.00	64.63	Hewlett-Packard Co.*	67.38	1.50	2.88
NYS	29.75	14.13	Silicon Graphics	22.88	0.25	1.10
OTC	80.88	50.75	Sun Microsystems Inc.*	31.13	3.25	11.66
NYS	31.25	22.25	Tandy Corp.*	24.00	0.38	1.58
NYS	11.13	5.13	Zenith Electronics	6.75	0.00	0.00
OTC	25.50	3.25	Zeos International Ltd	3.25	0.38	15.09
Large Systems						Up 1.66%
ASE	50.63	11.63	Amdahl Corp.*	14.50	0.75	5.46
NYS	15.50	6.41	Cambex Corp.	14.13	0.13	0.89
NYS	16.38	5.25	Convex Computer (L)	9.88	1.00	18.60
OTC	16.63	1.88	Cray Computer	3.00	-0.63	-17.24
NYS	29.25	22.75	Cray Research Inc.*	25.88	0.88	3.83
NYS	22.50	7.13	Data General Corp.	9.63	1.25	14.93
NYS	65.50	43.25	Digital Equipment Corp.*	48.00	2.13	5.92
NYS	106.38	81.63	IBM*	86.00	2.00	2.33
OTC	13.25	7.50	Kendall Square Research	9.00	0.25	2.86
NYS	121.25	89.25	Matsushita Electronics	89.00	-5.50	-5.82
OTC	19.75	7.13	Pyramid Technology	7.13	-1.00	-12.31
OTC	17.38	6.13	Sequent Computer Sys.	19.63	2.00	13.86
OTC	16.38	5.00	Sequoia Systems Inc.	8.00	-0.13	-1.54
NYS	94.25	66.75	Stratus Computer Inc.*	46.00	2.00	4.55
NYS	15.13	8.50	Tandem Computers Inc.*	11.13	0.88	8.66
NYS	11.75	3.63	Unisys Corp.*	6.88	0.00	0.00
ASE	7.50	0.25	Wang Labs Inc. (B)*	0.50	-0.06	-11.16
Software						Up 1.03%
OTC	68.50	31.75	Adobe Systems Inc. (L)	32.38	-2.38	-6.83
OTC	13.25	2.50	Al Corp.	3.38	-0.25	-6.50
OTC	45.00	11.50	Aldus Corp.	12.75	0.50	4.08
OTC	19.75	9.50	American Software Inc.	10.13	0.50	5.19
OTC	20.00	9.75	Ask Computer Systems	10.25	0.38	2.38
OTC	82.00	63.25	Autodesk Inc.	49.50	0.75	1.54
OTC	37.75	7.50	Bachman Info. Systems	8.00	-0.75	-8.57
OTC	42.50	50.50	BGS Systems Inc.	38.50	-1.00	-2.67
OTC	75.00	37.25	BMC Software Inc.	57.00	2.63	4.83
OTC	50.50	9.00	Boole & Babbage	16.50	-0.25	-1.35
OTC	48.75	35.00	Borland Int'l Inc.*	86.38	3.88	8.12
OTC	11.25	3.63	CE Software	4.13	0.13	3.13
ASE	19.88	6.88	Cheyenne Software Inc. (H)	19.88	0.75	4.05
OTC	20.38	6.88	Cognos Inc. (L)	8.88	-0.38	-8.17
NYS	17.00	7.50	Computer Associates*	16.00	1.50	10.34
Exch	52-Week High	52-Week Low		Sept. 11 Close	Wk Net Change	Wk Pct Change
NYS	12.38	9.75	Computervision Corp.	10.75	0.38	3.61
OTC	20.50	8.00	Cornshare Inc.	8.00	-0.38	-4.48
OTC	47.88	8.50	Excel Corp.	9.00	-0.25	-3.03
OTC	25.50	11.50	Group I Software	15.00	-1.25	-7.69
OTC	9.63	3.50	Hogan Systems Inc.	4.88	0.38	8.33
OTC	36.25	18.50	Information Resources	25.25	3.75	17.44
OTC	40.88	9.00	Informix Corp (H)	40.88	2.88	7.57
OTC	27.38	12.50	Intergraph Corp.	14.25	-0.25	-1.72
OTC	15.00	6.25	Interleaf Inc.	6.38	-0.50	-9.09
OTC	20.25	9.75	Intersolv Inc.	19.00	1.83	11.30
OTC	22.75	10.50	Knowledgeware Inc.	12.00	0.25	2.13
OTC	48.00	24.50	Legent Corp.*	48.00	1.38	2.96
OTC	36.75	19.50	Lotus Development*	17.75	0.25	1.43
OTC	7.38	1.88	Maca Software	3.38	0.63	22.73
OTC	22.25	6.50	Mentor Graphics	7.50	-0.25	-3.23
OTC	37.25	27.25	Micro Focus	34.38	-0.13	-0.36
OTC	20.50	6.50	Micrografx Inc.	9.50	-0.13	-1.45
OTC	86.84	64.86	Microsoft Corp.*	75.75	2.75	3.62
OTC	21.13	10.25	Oracle Corp.*	16.75	1.25	8.75
OTC	47.75	15.50	Parametric Technology (H)	47.75	3.38	7.81
OTC	11.00	3.50	Phoenix Technologies	3.88	-0.88	-8.82
OTC	25.25	12.13	Platinum Technology	17.00	0.25	1.49
OTC	46.50	25.00	Progress Software Corp.	64.13	4.38	11.01
OTC	26.63	4.00	Quarterdeck Office Sys.	4.38	-0.13	-2.78
OTC	22.75	11.75	Rainbow Technologies Inc.	17.00	0.13	0.74
OTC	24.50	7.50	Restorage	9.25	-0.25	-2.63
OTC	17.25	5.38	Ross Systems	6.50	-0.88	-11.88
OTC	12.13	8.50	Sapiens USA Inc.	12.00	0.25	2.13
OTC	28.25	7.50	Software Publishing Corp.	10.50	0.50	5.00
OTC	8.50	2.00	Software Toolworks Inc.	3.13	0.19	6.36
OTC	7.25	1.75	Spinnaker Software	2.38	0.13	5.56
OTC	16.50	6.25	State of the Art	6.25	-0.38	-5.66
NYS	29.25	13.75	Sterling Software Inc.	17.88	-0.75	-4.03
OTC	50.00	10.50	Struct. Dynamics Research (L)	10.50	-4.50	-30.00
OTC	34.25	15.50	Sybase Inc.	34.25	3.75	12.30
OTC	61.00	15.50	Symantec Corp.	15.50	-1.00	-6.06
NYS	15.50	5.25	Systems Center Inc.*	6.25	0.00	0.00
OTC	34.25	13.00	System Software Assoc.	23.50	-1.25	-5.05
OTC	23.75	14.50	Walker Interactive Systems	16.50	1.25	8.86
OTC	6.63	2.00	Wonderlar (L)	2.25	0.00	0.00
Semiconductors						Up 5.84%
NYS	21.50	7.38	Advanced Micro Devices	12.38	1.25	11.24
NYS	11.13	7.00	Analog Devices Inc.	10.75	0.88	8.86
OTC	12.00	6.75	Atmel Corp.	11.00	1.50	15.75
OTC	14.13	3.25	Chips and Technologies	4.00	-0.25	-5.88
NYS	21.50	7.38	Cypress Semiconductor Corp	10.00	0.88	3.50
NYS	11.63	6.25	Dallas Semiconductor (H)	11.25	0.13	1.12
OTC	68.75	38.50	Intel Corp.*	64.00	2.75	4.49
NYS	9.88	4.88	LSI Logic Corp.	9.50	0.75	13.09
NYS	22.38	12.13	Micron Technology	15.25	0.50	3.39
NYS	90.00	64.00	Motorola Inc.* (H)	90.00	2.00	2.27
NYS	11.88	3.88	National Semiconductor*	11.88	1.00	9.20
OTC	27.00	6.25	Sierra Semiconductor	12.00	0.00	0.00
NYS	43.50	26.00	Texas Instruments*	43.50	2.75	6.75
OTC	10.50	6.00	VLSI Technology	6.50	0.75	9.68
OTC	6.75	2.13	Weitek	3.00	0.13	4.36
OTC	5.63	2.00	Western Digital Corp.	4.50	-0.13	-2.70
OTC	32.50	17.25	Xilinx	50.50	2.88	16.31
OTC	11.50	4.63	Zilog Inc.	7.63	0.25	3.38
Peripherals and Subsystems						Up 1.93%
OTC	10.00	2.75	Archive Corp.	7.63	0.00	0.00
OTC	20.50	13.00	Banctec Inc.	20.25	0.50	1.94
OTC	23.50	6.63	Cambex Corp.	12.00	0.50	4.35
ASE	12.25	4.91	Cognitronics Corp	11.38	0.00	0.00
NYS	23.88	12.50	Conner Peripherals*	21.63	0.63	2.98
ASE	19.88	4.41	Dataram Corp.	7.13	-0.13	-1.72
NYS	19.25	6.88	EMC Corp.	17.75	1.13	6.77
OTC	8.38	4.75	Emulex Corp.	6.75	-0.88	-6.12
OTC	33.00	14.25	Evans & Sutherland	10.25	0.50	3.17
OTC	40.63	21.00	Exabyte	23.75	1.50	6.74
OTC	27.25	15.75	Intelligent Info. Systems	25.50	2.00	8.51
OTC	11.25	4.75	Iomega Corp.	9.25	-0.63	-6.00
OTC	34.13	10.25	IPL Systems Inc.	13.00	2.25	20.93
OTC	24.50	10.75	Komag Inc.	16.38	1.13	8.52
OTC	16.00	3.44	Maxtor Corp.* (H)	13.88	-0.50	-3.48
OTC	12.63	5.75	Micropolis Corp.	9.63	0.88	4.05
NYS	101.25	85.38	3M Co.	88.38	-0.13	-0.13
OTC	7.00	3.50	Prometrix Inc.	5.63	0.13	2.27
NYS	38.75	7.00	QMS Inc.	8.38	0.38	4.17
OTC	19.00	6.88	Quantum Corp.	15.50	0.88	5.98
OTC	12.75	4.75	Radius Inc.	4.75	-2.50	-34.48
OTC	12.50	6.88	Recognition Equipment	11.13	1.25	12.68
OTC	13.13	6.38	Reson Inc.	10.13	0.50	5.19
OTC	17.63	7.38	Seagate Technology*	16.00	0.50	3.85
NYS	78.00	26.75	Storage Technology*	31.50	2.00	6.80
NYS	20.50	18.00	Tektronix Inc.	20.50	0.00	0.00
NYS	82.25	56.88	Xerox Corp.	75.75	0.50	0.66
Services						Up 2.13%
OTC	19.50	11.86	American Mgmt. Systems* (H)	19.13	-0.13	-0.65
OTC	5.88	2.50	Answerthink Inc.	3.25	0.13	4.00
OTC	19.00	12.50	Analysts Int'l	17.75	-0.75	-4.05
NYS	69.00	22.88	Auto Data Processing*	48.88	1.75	3.86
NYS	24.18	12.50	Comdisco Inc.	16.25	0.25	1.56
OTC	13.50	7.75	Computer Horizons	9.00	0.75	9.09
NYS	64.88	57.00	Computer Sciences*	58.88	0.00	0.00
NYS	10.13	7.00	Computer Task Group	7.88	-0.75	-9.09
OTC	40.50	15.00	CompUSA Inc.	32.75	3.38	11.86
OTC	12.25	6.00	Corporate Software	7.50	-0.50	-6.25
OTC	50.75	9.25	Egghead Discount Software	10.00	-0.50	-4.75
NYS	33.06	23.19	General Motors E (EDS)*	25.88	0.75	2.58
OTC	30.88	6.25	Intelligent Electronics	10.63	1.13	11.84
OTC	14.88	3.13	Mentor	9.13	1.13	14.09
OTC	19.75	7.50	Microage Inc.	10.13	0.75	8.00
OTC	29.00	15.50	Paychex	27.25	0.25	0.93
NYS	78.13	48.50	Policy Management Sys. (H)	74.88	-0.63	-0.83
OTC	47.50	22.50	Reynolds and Reynolds	42.13	-0.50	-1.17
OTC	39.00	21.25	SEI Corp.	25.50	0.75	3.03
OTC	24.88	16.88	Shared Medical Systems	20.25	0.63	3.16
OTC	28.50	18.50	Sungard Data Systems (H)	28.50	1.75	6.54
NYS	3.63	1.13	Ultimate Corp.	1.50	-0.13	-7.69

KEY: (H) = New annual high (L) = New annual low

* Companies tracked in Computerworld Stock Index

Copyright Nordby International, Inc., Boulder, Colo.

The information is obtained from sources believed to be reliable but cannot be guaranteed to be completely accurate. This information is subject to change without notice.

Second-class postage paid at Framingham, Mass., and additional mailing offices. *Computerworld* (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Copyright 1992 by CW Publishing/Inc. All rights reserved. *Computerworld* can be purchased on microfilm and microfiche through University Microfilms Inc., 300 N. Zeeb Road, Ann Arbor, Mich. 48106. *Computerworld* is indexed. Back issues, if available, may be purchased through Margaret McIndoe. Photocopy rights: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Publishing/Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970. 508-744-3350. Reprints (minimum 500 copies) and permission to reprint may be purchased from Sharon Bryant, CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Requests for missing issues will be honored only if received within 60 days of issue date. Subscription rates: $2.00 a copy: U.S. — $48 a year; Canada — $110 a year; Central & So. America — $130 (surface), $250.00 (airmail) a year; Europe — $195 a year; all other countries — $295 a year. Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Subscriptions call toll free (800) 669-1002.
POSTMASTER: Send Form 3579 (Change of Address) to *Computerworld*, P.O. Box 2044, Marion, OH 43305.

IN BRIEF

Radius' sales drop

■ **Radius, Inc.**, a San Jose, Calif., maker of personal computer and **Apple Computer, Inc.** Macintosh enhancement products, last week said sales in the quarter ending Sept. 30 will be lower than anticipated. Revenue for the period is expected to be comparable with the $35.5 million in the corresponding quarter last year and below the $44.2 million posted in the previous quarter. Radius blamed the shortfall on lower demand for its core products and trouble getting a supplier to fill orders for its 15-in. monochrome displays.

■ **National Semiconductor Corp.** reported fiscal first-quarter earnings of $21.9 million compared with a $168 million loss — including a $149.3 million restructuring charge — in the same period last year. Revenue in the period was up 15% to $472.4 million.

■ Swiss telecommunications firm **Ascom Holding AG** said fiscal 1992 profits could be lower than the 54.3 million Swiss francs ($43.4 millioo U.S.) it made in 1991. The owner of T1 multiplexer maker **Timeplex, Inc.** in Woodcliff, N.J., said revenue for the first half of 1992 rose 18% to 1.66 billion francs ($1.33 billion U.S.), and orders received climbed 25% to 1.78 billion francs ($1.42 billion U.S.).

■ Frame-relay switch start-up **Cascade Communications Corp.**, which is headed by former Timeplex President Victoria Brown, has received nearly $7 million in a second round of financing.

■ A federal bankruptcy court in Bostoo ordered **Expeditors International of Washington, Inc.**, a Wang Laboratories, Inc. equipment shipper, to deliver eight of 14 containers of PCs to Wal-Mart Stores, Inc. outlets. Expeditors had delayed dropoff of the goods, saying that Wang owes it $100,000.

Discounters to sell Compaq's low-end line

Circuit City, CompUSA, Office Depot to offer ProLinea, Contura; Can company meet demand?

BY CAROL HILDEBRAND
CW STAFF

HOUSTON — Despite a protracted inability to meet demand, Compaq Computer Corp. further expanded its distributioo options last week by signing mass retailers Circuit City, CompUSA and Office Depot, Inc. to sell its low-end ProLinea desktop and Contura notebook personal computers.

Compaq's Cooley *is ready to fill mass retailers' shelves*

Both analysts and Compaq's more traditional resellers warned that the PC giant riska putting off even more sales if it gets caught with its warehouse empty. Compaq has been fighting a backlog of demand for its low-cost ProLineas and Conturas, models that were introduced in June.

The families have proved so popular that Compaq cannot keep up with demand, according to users and resellers. Expanding the distribution channel by 300 new outlets could well exacerbate the problem.

"They're walking a fine line between dropping prices and goosing demand and not being able to supply the dealers," said Kimball Brown, an analyst at International Data Corp. in Mountain View, Calif.

However, Brown said moving into mass retailing is important if the company is to remain competitive, particularly in light of IBM's announcement last week of an aggressively priced Personal System/1 line aimed specifically at the mass merchandising channel. (see story page 8.)

William Tauscher, chief executive officer at Computerland Corp., said he had spoken to Compaq CEO Eckhard Pfeiffer about trying to resolve the delivery problems. "I told him he should make more," he said. On a more serious oote, Tauscher said Computerland would have no problem selling what Compaq could send. "He wanted to know how many units we would like from him for next month. I told him as many as he can make; that's what we want," he said.

Ross Cooley, president of Compaq USA, said the company is still working on filling the backlog of orders. He predicted Compaq would be ramped up enough to fill mass retailers' shelves in time for the busy December selling season and will hopefully ship the product to retailers in late September, thus filling that channel by mid-October.

VAR experimentation

Cooley also said Compaq was experimenting with mail order through several of its value-added resellers; the fourth quarter might see an expansion in that direction, he added.

The company has brought in Michael Norris as vice president of consumer products to watch over this new channel.

"This is quite a departure for Compaq. We don't have a history of going out and hiring a lot of vice presidents, and we needed someone who will understand the market," Cooley said.

Senior writer Michael Fitzgerald contributed to this report.

Extended family

HOUSTON — Compaq will expand its hot-selling Contura and ProLinea product lines today, while adding features to the entire ProLinea line.

Compaq will introduce the 6.7-pound Contura 3/25C, a passive-matrix, color notebook with an 84M-byte hard drive that is expected to start at $2,799. A nickel-metal hydride battery generates three hours of battery life. Based on Intel Corp.'s 25-MHz 80386SL, Compaq has targeted its pricing at passive-matrix notebooks from Dell Computer Corp. and AST Research, Inc. These products are available now.

The ProLinea line got a power boost with the 25-MHz 1486SX and the 50-MHz 486DX appearing inside systems. Compaq expects to see pricing on the ProLinea 4/50 start at $2,049 and the ProLinea 4/25s at $1,349.

Andrew Watson, Compaq's director of North American portables marketing, said Compaq delayed announcing these products to ensure it can meet demand, something that has plagued the firm since the introducution of new lines in June.

The ProLinea line as a whole gained several features: a variety of security features, an option of interlaced or noninterlaced video output, up to 32M bytes of random-access memory and 240M-byte hard drives.

MICHAEL FITZGERALD

Commission-based sales to begin at DEC

Move suggests influence of CEO-elect Palmer

BY MELINDA-CAROL BALLOU
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. sales representatives will have even more incentive beyond just keeping their jobs beginning in January, when the beleaguered minicomputer maker adopts a commission-based sales plan.

"We are going to undertake a modest evolution of our inceotive compensation program for U.S. salespeople, which will offer a more direct linkage of pay for performance," a DEC spokesman said.

He refused to confirm details of the plan, saying the company must inform its internal sales force before going public. One published report said the company is considering giving its salespeople 20% of their annual salaries in commission.

Some skepticism

However, skeptical analysts said that layoffs already well under way offer a much stronger incentive than anything DEC could do in terms of compensation.

"Providing the DEC sales force with a commission atructure is a step in the right direction, but it's a day late and a dollar short," said John Logan, vice president at Aberdeen Group, a market research firm based in Boston.

"A few years ago, DEC started giving out bonuses via an incentive plan, but at this point, the typical DEC sales reps are fighting for something more than a commission — and that's their jobs," he said.

Departing longtime chief executive officer Kenneth Olsen vehemently opposed commission-based sales and blocked the adoption of earlier, similar moves.

This shift in policy is the harbinger of a companywide restructuring resulting from the transfer of leadership to CEO-elect Robert Palmer, who will take over from Olsen on Oct. 1.

Switching channels

Recent cutbacks in DEC's direct sales force areleading to a greater reliance on non-DEC marketing channels, such as value-added resellers, distributors, systems integrators and other third parties.

Twenty-six percent of DEC's U.S. sales came through such channels during fiscal 1992, DEC officials said.

A program instituted last year emphasized channels marketing for account reps and began to measure them on a "profit-and loss statement, making them entrepreneurs rather than just hardware salesmen," according to a second DEC spokesman. "If the total business generated was not enough so that the manager could say 'I'm profitable,' then there were cuts."

> "PROVIDING THE DEC sales force with a commission structure is a step in the right direction, but it's a day late and a dollar short."
>
> JOHN LOGAN
> ABERDEEN GROUP

By Rick Blum

Hello, sir. Welcome to Lotta Computers and our one-day, 50% off everything sale. I'm Mr. Ram. How can I help you?

Hi. I'm the purchasing agent for Costello Community College. Can you tell me what your most popular word processing software is?

WriteNow.

I'd appreciate it.

You'd appreciate what?

I'd appreciate if you'd tell me the name of your most popular word processing package.

WriteNow.

I don't understand you. I ask a simple question, and you keep putting me off. Tell me your most popular word processing software.

WriteNow.

There you go again. Listen, maybe we should skip the software and decide on hardware, instead. Can you recommend something that's designed for an educational setting?

Next.

If you don't know the answer, why don't you just say so instead of trying to get rid of me?

I'm not trying to get rid of you. I'm just recommending a good workstation that's designed specifically for colleges and universities.

Then what is it?

I told you. Next.

Fine. Have it your way. I'll just go across the street to Notmenny Computers and do my business there.

Please don't go. Educational institutions are very important to Lotta Computers. Let's try again. What exactly is it you need to decide?

I need to decide on our next computer and right now.

I'm sorry, but they don't work together.

What doesn't?

The hardware and software you just named.

How could I name them? I hardly know a thing about computers! I have an idea. Why don't we forget all this hardware/software stuff for a minute and instead just pick an established company with a wide range of products. What do you say?

I'd say Bull.

Excuse me! I admit I don't know much about computers, but you don't have to insult me.

I would never do such a thing. Let's pick another company if you don't want Bull.

I certainly don't.

OK, no Bull.

Good. Would it be a good place to start by asking what the best PC is that you carry?

Sure. I'd say that's Wyse.

Well, thanks. I take pride in choosing only prime products for our students.

I'm sorry, but you can't get a Prime PC anymore. You really should get Wyse.

I'm getting pretty wise to you, buddy. Look, all I want is a good PC.

Well, that's easy. The choice is Wyse.

Great. Half an hour and all we've decided is to make a wise choice. I can't wait to find out what's next.

It's a workstation specifically designed for colleges and universities.

How did we get back to workstations?

You mentioned a brand. Next.

I'll move on, but this is your last chance — put together a system with the works and, if the price is right, I'll make out a check today.

I'd be happy to. But if you want the Works, there's no reason to buy WriteNow.

But you said the sale is for one day only. I'd like to buy right now.

I'll sell you anything you want. But I warn you, WriteNow won't work on Wyse PCs, if that matters.

The only thing that matters is to get out of here so fast you'll think I had wings.

Well, if you want Wingz, forget about the Works. We'll put everything on a Mac rather than Wyse and I'll give you Word, instead.

Oh yeah? Well, here's my word — Good-bye!

* * * *

— Blum is a free-lance writer and principal at Aquiline Associates in Carlisle, Mass.

Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Lory Dix or Jodie Naze at (800) 343-6474. If we use your ideas, we'll send you a gift.

INSIDE LINES

Face-lift for LANs?

▶ 3Com and IBM are reportedly working feverishly to bring higher transmission speeds to Token Ring and Ethernet LANs. 3Com will likely debut a 100M bit/sec. Ethernet LAN as soon as the end of the year, according to an analyst who has been briefed, and IBM is allegedly working on a 32M bit/sec. Token Ring LAN that it plans to continue enhancing in increments of 32M bit/sec. Interesting moves, given user enthusiasm over the much-touted and pending Asynchronous Transfer Mode next-generation LAN that does not require attached nodes to share bandwidth. The higher speed Ethernet, though cheaper than 100M bit/sec. FDDI, one analyst said, will require users to purchase new adapter cards and wiring hubs.

Alpha, beta

▶ DEC is expected to officially unveil its next generation Alpha systems next month. Included will be "Flamingo," a desktop workstation for upgrading from the VAX 4000 60 series; "Cobra," a departmental machine with 2G bytes of memory for upgrading from the 4000 series; and "Ruby," a machine with up to four CPUs and 12G bytes of memory.

Tick, tick, tick . . .

▶ IBM has always said it would never resell a clone PC in the U.S. But IBM Personal Computer Co. management may have different ideas. Sources said the PS/1 line has only about 30 days to start proving itself a winner. If it fails, antsy Blue bigwigs will reportedly start considering the charms of the Ambra. Ambra is a non-IBM brand currently sold, at arm's length, by IBM in Canada, Europe and Latin America.

Bluding the cannibals?

▶ There's been some juggling of the dates in IBM Personal Computer Co.'s September product announcements. Sept. 21 was to have been the date for both the revamped PS/2 debut and the great ValuePoint line extravaganza. Now, however, ValuePoint has been pushed back until the end of next month. IBM explained it wanted to give each brand team its own day in the sun, but skeptical minds say the company has to wait until reorganized support people have time to get into place. Still more cynical minds said the delay gives the PS/2 line a small time frame to sell in before the product cannibalization kicks in. IBM's new ThinkPad and a slew of new notebooks will debut Oct. 6.

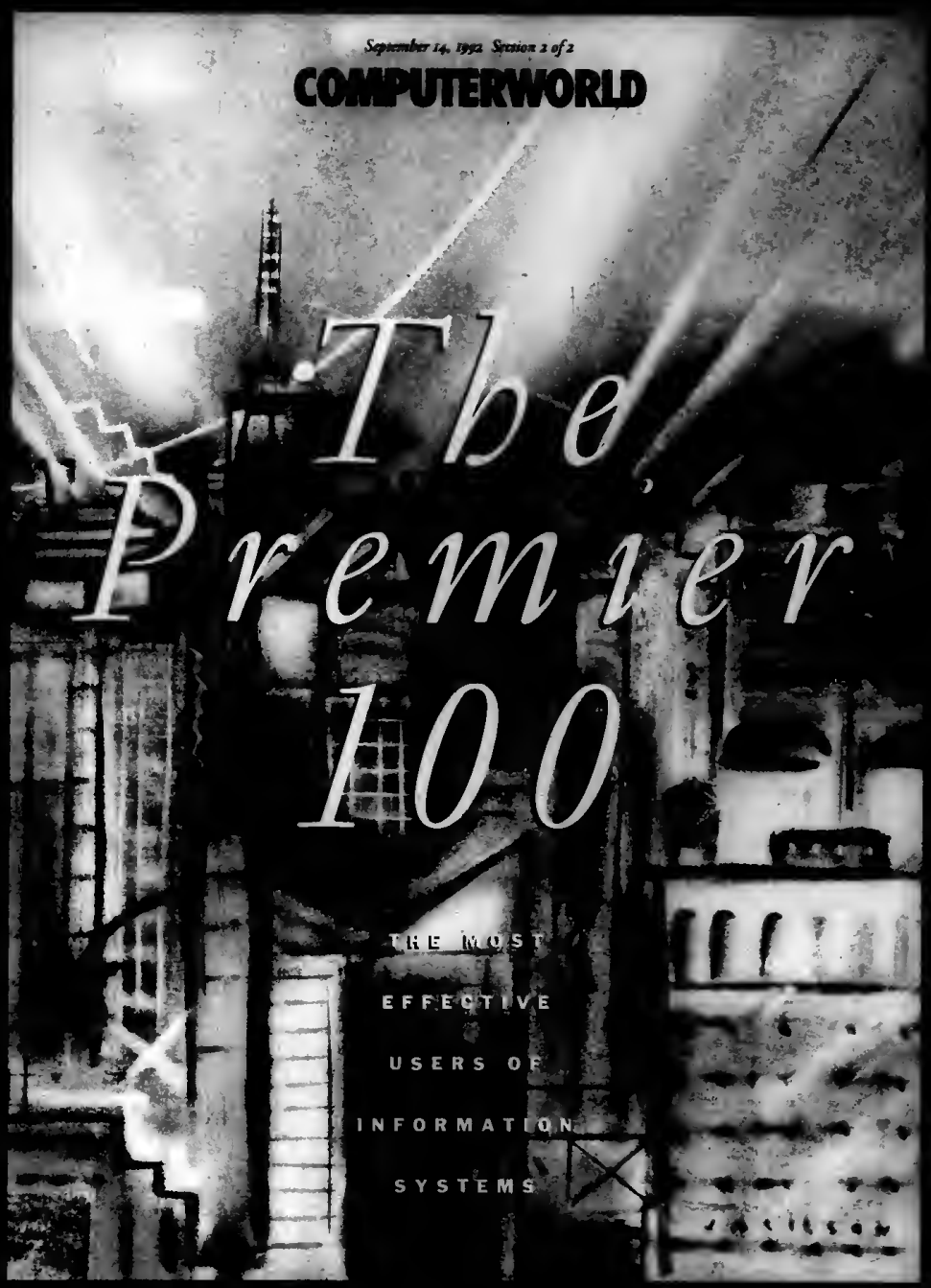
Closed windows

▶ Microsoft is apparently angering a few software vendors who use the word "Windows" in their product names. According to sources, Microsoft has recently received trademark authorization on Windows and is sending cease-and-desist letters to some software vendors, requesting that they either change the product name or, in some cases, license the name (though reportedly for no fee). Microsoft confirmed it is "working with" some vendors to meet the company's trademark requirements. An attempt is being made to organize some purportedly infringing vendors to fight the trademark claim, the sources said.

CD a-go-go

▶ Sony will try to make multimedia portable when it officially introduces its oft-previewed Bookman, now named the Multimedia CD-ROM Player, on Wednesday. Sources said the player will weigh approximately 2 pounds and come in a 6- by 4-in. package. Eleven software vendors, including IBM and Microsoft, will announce their support for the device.

Democratic party insiders jumping the gun on the November presidential election are already discussing who will be in the Clinton cabinet. Some of the names being tossed around would definitely tilt a Clinton administration toward an activist U.S. technology policy. The candidates include Robert Reich for chairman of the Council of Economic Advisors, Roger Altman for Secretary of the Treasury, Henry Cisneros for Secretary of Commerce and — this is a big maybe — Paul Tsongas for director of the Office of Management and Budget. All of them are big fans of high-tech industries. So is News Editor Alan Alper. Phone, fax or CompuServe serve him with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's ***24-hour voice-mail tip line at (508) 820-8555.***


September 14, 1992 Section 2 of 2
COMPUTERWORLD
The Premier 100
THE MOST EFFECTIVE USERS OF INFORMATION SYSTEMS

This is the company you

see in your rear-view mirror,

lights flashing,

passing the pack,

shouting

client-server computing.

©1992 Sun Microsystems, Inc Sun, Sun Microsystems, and the Sun logo are trademarks or registered trademarks of Sun Microsystems, Inc All SPARC trademarks, including the SCD Compliant logo, are trademarks or registered trademarks of SPARC International, Inc SPARCstation is licensed exclusively to Sun Microsystems, Inc Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

COMPUTERWORLD

Professional Courtesy Rate

YES, I want to receive my own copy of Computerworld each week. I accept your offer of $38.95* for 51 weekly issues.

Address is ☐ Home ☐ Business Basic rate $48 per year

* U S Only Canada $74 97, Central/South America $130, Europe $195, all other countries $295 Foreign orders must be prepaid in U S dollars

Name Title

Company

Address

City State Zip

Please complete the information below to qualify for this special offer.

1. BUSINESS INDUSTRY (Circle one)
   - 10. Manufacturer (other than computer)
   - 20 Finance/Insurance/Real Estate
   - 30 Medicine/Law/Education
   - 80 Wholesale/Retail/Trade
   - 50 Business Service (except DP)
   - 60. Government State/Federal/Local
   - 65 Communications Systems/Public Utilities/Transportation
   - 70. Mining/Construction/Petroleum/Refining/ Agric
   - 80. Manufacturer of Computers Computer Related Systems or Peripherals
   - 85. System Integrators, VARs Computer Service Bureaus Software Planning & Consulting Services
   - 90. Computer/Peripheral Dealer/Distr /Retailer
   - 95. Other _____ (Please specify)

2. TITLE FUNCTION (Circle one)

   IS/MIS/DP MANAGEMENT
   - 18. Chief Information Officer/Vice President/ Asst VP IS/MIS/DP Management
   - 21. Dir /Mgr MIS Services Information Center
   - 22. Dir /Mgr, Tech Planning, Adm Svcs , Data Comm Network Sys Mgt , LAN Mgr , PC Mgr
   - 23. Dir /Mgr Sys Development, Sys Architecture
   - 31 Programming Management, Software Developers
   - 41. Engineering Scientific R&D Tech Mgr
   - 60 Sys Integrators/ VARs/Consulting Mgt

   CORPORATE MANAGEMENT
   - 11. President, Owner/Partner, General Mgt
   - 12. Vice President Asst VP
   - 13. Treasurer, Controller, Financial Officer

   DEPARTMENTAL MANAGEMENT
   - 51. Sales & Mktg. Management
   - 70. Medical, Legal Accounting Mgt

   OTHER PROFESSIONAL MANAGEMENT
   - 80. Educator, Journalists, Librarians, Students
   - 90. Other Titled Personnel

3. Does your job function require involvement with your company's or your client's computer/ information systems/data processing/communications systems? (Please check only one)

   ☐ YES ☐ NO

Recycled Paper E42JP-2

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

COMPUTERWORLD

Professional Courtesy Rate

YES, I want to receive my own copy of Computerworld each week. I accept your offer of $38.95* for 51 weekly issues.

Address is: ☐ Home ☐ Business Basic rate. $48 per year.

* U.S. Only. Canada $74.87, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Please complete the information below to qualify for this special offer.

1. BUSINESS/INDUSTRY (Circle one)
   10. Manufacturer (other than computer)
   20. Finance/Insurance/Real Estate
   30. Medicine/Law/Education
   40. Wholesale/Retail/Trade
   50. Business Service (except DP)
   60. Government - State/Federal/Local
   68. Communications Systems/Public Utilities/Transportation
   70. Mining/Construction/Petroleum/Refining/Agric.
   80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   88. System Integrators VARs, Computer Service Bureaus, Software Planning & Consulting Services
   90. Computer/Peripheral Dealer/Distr./Retailer
   99. Other _____ (Please specify)

2. TITLE/FUNCTION (Circle one)

   IS/MIS/DP MANAGEMENT
   10. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
   21. Dir./Mgr. MIS Services, Information Center
   22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt., LAN Mgt., PC Mgr.
   23. Dir./Mgr. Sys. Development, Sys. Architecture
   31. Programming Management, Software Developers
   41. Engineering, Scientific, R&D, Tech. Mgt.
   80. Sys. Integrators/ VARs/Consulting Mgt.

   CORPORATE MANAGEMENT
   11. President, Owner/Partner, General Mgt.
   12. Vice President, Asst. VP
   13. Treasurer, Controller, Financial Officer

   DEPARTMENTAL MANAGEMENT
   51. Sales & Mktg. Management
   70. Medical, Legal, Accounting Mgt.

   OTHER PROFESSIONAL MANAGEMENT
   90. Educator, Journalists, Librarians, Students
   99. Other Titled Personnel

3. Does your job function require involvement with your company's or your client's computer/information systems/data processing/communications systems? (Please check only one)
   ☐ YES ☐ NO

♻ Recycled Paper E42JP-2

May we introduce ourselves?

Ten years ago, we started the engine of a new computer company with a radical idea. To bring to the world the first client-server computing platform that was truly open. Nothing proprietary. Nothing hidden from view.

Nearly four billion dollars in annual revenue later, it can safely be said our aim was true.

Not only is Sun™ outperforming the biggest names in computing, we've grown at a rate five times faster than the industry as a whole.

Today, in 125 countries, more than 500,000 people use Sun computers, making us the world's largest maker of UNIX™ computers. And the world's most popular distributed computing solution ever.

We are the only UNIX-based computer company that can offer compatible, scalable chip technology for notebook computers to supercomputers.

As well as the only computer company with 16,000 service and support experts in UNIX, in 65 centers around the world.

And that's just the view from *our* rear-view mirror. To find out how you can lower your computing costs while raising productivity, call 1-800-426-5321, ext. 500. And ask to see where client-server computing is headed.

Sun

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc Business

Computerworld
Premier 100

EDITORS
Michael L. Sullivan-Trainor
Joanne Kelleher

MANAGING EDITOR
Joyce Chutchian

DESIGNER
Tom Monahan

ASSISTANT MANAGING EDITOR
Alice Lesch Kelly

WRITERS
Amy Bernstein
Barbara Francett
Cheryl Goldberg
Kathleen Gow
Lucie Juneau
Julia King
Alice LaPlante
Emily Leinfuss
Daniel Lyons
Mark Mehler

CHIEF COPY EDITOR
Catherine Gagnon

COPY EDITORS
Kimberlee A. Smith
Steven J. Condon
Anne McCrory
Stephen P. Klett Jr.
Christina Maguire

FREELANCE EDITOR
Peter Tietjen

RESEARCHER
Lisa Davidson

PRODUCTION MANAGER
Christopher P. Cuoco

ADVERTISING COORDINATOR
Peggy Hennessey

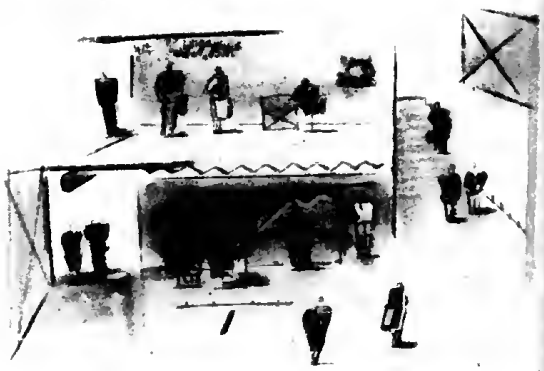
EDITOR IN CHIEF
Bill Laberis

Copyright 1992 by CW Publishing, Inc. All rights reserved.

Computerworld can be purchased on 35mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich., 48106. Photocopy rights: Permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Publishing, Inc. for libraries and other users registered with the Copyright Clearance Center provided that the base fee of $3.00 per copy of the article, plus 50 cents per page, is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, Mass., 01970. Reprints (minimum 500 copies) and permission to reprint may be purchased from Sharon Bryant, CW Publishing, Inc., 375 Cochituate Road, Box 9171, Framingham, Mass., 01701-9171. Subscriptions call toll free (800) 669-1002. Requests for missing issues will be honored only if received within 60 days of issue date. Subscription rates: $2.00 a copy; U.S. – $48 a year; Canada, Central & So. America – $110 a year; Europe – $165 a year; all other countries – $245 a year (airmail service).

COVER ILLUSTRATION
Jeff Jackson

COVER DESIGN
Concrete Design Communications



ABOUT THIS ISSUE

4

RISING ABOVE THE CHALLENGES

In a tough year, IS executives balance strategic necessities with cost constraints and learn how to take measured risks.

WINNERS BY INDUSTRY

10

AEROSPACE

Do it smart and do it once: Beleaguered industry emphasizes streamlining and waste reduction.

By Kathleen Gow

13

CONSUMER PRODUCTS AND SERVICES

Catering to the customer: Well-stocked store shelves keep retailers happy.

By Barbara Francett

18

FINANCIAL SERVICES

Growth is relative: Budgets are bigger, but so are expectations.

By Amy Bernstein

DRESSER INDUSTRIES' *Henry Paulsen, page 21*

21

INDUSTRIAL AND AUTOMOTIVE PRODUCTS

New spirit of conservatism: This is not the time for experimentation.

By Mark Mehler

26

MANUFACTURING

Breaking the mold: Companies concentrate on strengthening the customer link.

By Emily Leinfuss

PHOTOGRAPHY: HENRY PAULSEN BY DAN BRYANT. ILLUSTRATION BY JEFF JACKSON

Editors' Note

No more easy wins

Excellence comes easier in the midst of prosperity. So IS executives whose companies are among the *Computerworld Premier 100* industry groups this year deserve a special round of applause. They have not only adjusted to the realities of a sustained recession in terms of their own operations but have helped their companies to stay on course and in the race.

The challenges that confront IS executives these days are unique. They are being asked to help produce radical and rapid change in a setting of financial austerity. In many cases, that means devising systems that will cut costs and help to distinguish their company in the marketplace. The performance bar has been raised several notches, and there are no more easy wins.

Premier 100 IS executives have a number of things in common. One is a feel for corporate priorities; another is a sense of when technological risk-taking is appropriate. Still another is the admiration of their industry peers. We feel strongly that no one is better equipped to judge a company's IS effectiveness than another IS executive in the same industry. For that reason, we have doubled the weight given to peer ratings in this year's selection of the *Premier 100*.

Our congratulations to the winning companies – the most effective corporate users of information systems in the U.S. – and to the executives who guided their use of technology. This designation has never been an easy one to earn, but this year it really took something extra. ■

PHILLIPS PETROLEUM'S *Jim Gottardi, page 29*

29

PETROLEUM AND CHEMICALS

Down to fighting weight: Less is more as users battle recession.

By Cheryl Goldberg

34

PHARMACEUTICALS AND FOOD

Spending for the future: Companies take advantage of a buyer's market.

By Daniel Lyons

37

RETAILING AND WHOLESALING

Luring consumers with conspicuous efficiency: Limited but well-targeted spending pays off.

By Lucie Juneau

42

TRANSPORTATION

The name of the game is revenue generation: Information can be a money maker.

By Julia King

47

UTILITIES

Betting the farm on technology: Stay ahead or be vulnerable.

By Amy Bernstein

MCI'S *Jim Zucco, page 47*

INSIDE THE 100

53

SELECTING THE TOP USERS

How we measure the effective use of IS in the *Computerworld Premier 100*.

54

THE PREMIER 100 TABLES

Detailed data on all 100 companies.

ACKNOWLEDGMENTS

Computerworld would like to acknowledge the following organizations for their assistance in creating this year's *Premier 100*: Anderson Consulting, Arthur D. Little, Inc., A. T. Kearney, CDC Index, Inc., Cleveland Consulting Associates, CW Database Division, Deloitte & Touche, Ernst & Young, First Market Research, International Data Corp., McKinsey & Co., Technology Investment Strategies Corp. and SNL Securities. We would also like to thank all the IS executives and their staffs for their time and patience in responding to our many inquiries.

LAST WORD

63

DO YOU HAVE WHAT IT TAKES?

Key factors in the successful use of information systems.

By DuWayne Peterson

PHOTOGRAPHY: JIM GOTTARDI BY ALAN LEVENSON. JIM ZUCCO BY KATHERINE LAMBERT

The Premier 100

Rising to the challenge

Top IS executives use a variety of strategies to overcome the hurdles of economic pressure and rapid change

The year: 1992. The place: the boardroom of a large Fortune 500 company. A chief information officer stands before the executive committee preparing to argue for several million dollars of extra leeway in the IS budget for the coming year. The CIO faced this same group last year and had to walk away without an increase. As a result, he's spent the whole year shuffling resources and trying to figure out how to get all those new systems built without dropping service levels or letting older systems deteriorate. This time, the audience isn't any easier.

Each committee member is aware of the slow economy and extreme pressure from domestic and foreign competitors on the company's bottom line. The chief executive officer in particular is concerned about an upcoming stockholder's meeting where he will have to explain last quarter's disappointing results.

Reviewing his options, the CIO realizes his staff's excitement over performance ratings of the new technology will not impress the group. Neither will they be interested in a discussion of the elegant software interfaces that his programmers have created to link diverse applications and make the front ends easier to use. He'd better cut to the chase.

Pulling himself to his full height, the CIO launches into a presentation stressing the long-term resource savings and process improvements that the switch to local-area network-based client/server systems will make possible. Sure, it will cost money up front, but down the road, an open systems approach will place more power in the hands of users.

The CIO restrains an urge to wipe his brow as the corners of the CEO's mouth turn up in an almost imperceptible smile. "He's buying it," the CIO thinks, knowing the executives would rather hear about downsizing than a requisition for another $10 million mainframe. "Now all I have

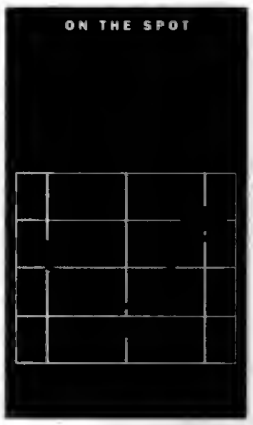
THE WINNERS

AEROSPACE	CONSUMER PRODUCTS AND SERVICES	FINANCIAL SERVICES	INDUSTRIAL AND AUTOMOTIVE PRODUCTS	MANUFACTURING
1. The Boeing Co.	1. Reader's Digest Association, Inc.	1. J. P. Morgan & Co.	1. Dresser Industries, Inc.	1. Kimberly-Clark Corp.
2. Grumman Corp.	2. Procter & Gamble Co.	2. Primerica Corp.	2. Black & Decker Corp.	2. Corning, Inc.
3. McDonnell Douglas Corp.	3. Levi Strauss Associates, Inc.	3. Banc One Corp.	3. Caterpillar, Inc.	3. 3M Co.
4. Martin Marietta Corp.	4. Gillette Co.	4. CoreStates Financial Corp.	4. Harley-Davidson, Inc.	4. Inland Steel Industries, Inc.
5. Lockheed Corp.	5. American Brands, Inc.	5. KeyCorp	5. Eaton Corp.	5. Cone Mills Corp.
6. Raytheon Co.	6. The Dun & Bradstreet Corp.	6. BankAmerica Corp.	6. Ford Motor Co.	6. Amoskeag Co.
7. Rockwell International Corp.	7. McGraw-Hill, Inc.	7. Barnett Banks, Inc.	7. Deere & Co.	7. Eastman Kodak Co.
8. Textron, Inc.	8. Helene Curtis Industries, Inc.	8. Unum Life Insurance Co.	8. Paccar, Inc.	8. Sonoco Products Co.
9. Northrop Corp.	9. Humana, Inc.	9. Bankers Trust New York Corp.	9. Trinity Industries, Inc.	9. Polaroid Corp.
10. General Dynamics Corp.	10. Johnson Controls, Inc.	10. Massachusetts Mutual Life Insurance Co.	10. Ingersoll-Rand Co.	10. Bethlehem Steel Corp.

to do is make it work." Quietly, he permits himself the gesture of tapping his knuckles on the table.

■

This CIO is not any of the executives listed in the 1992 *Premier 100*. But in many ways he represents them all. Whatever their industry, IS chiefs at the leading companies are feeling more performance pressure than ever before. They are being asked to come up with new kinds of systems and system configurations that will give their companies that all-important edge in the market, often with the stipulation that expense be held to a minimum.



Money is on everyone's mind this year. It isn't always a matter of actual budget cuts: More *Premier 100* executives saw increases last year than decreases (44% increased, 33% decreased, and 22% stayed flat).

In many cases, the big challenge is figuring out how to spread about the same amount of money over a lot more territory and satisfy escalating expectations in terms of impact per dollar spent.

At AMR Corp., for example, approval for new projects depends on a guarantee of 100% return on investment. Previously, says Max Hopper, senior vice president of information services, the goal might have been as low as a 15% return.

IS executives on the *Premier 100* list tell us that the eyes of management and shareholders are on them. Seventy-three percent say this scrutiny increased last year (see chart at left).

"Our markets are still terrible," says R. D. Sonnenburg, newly named director of computer IS at Deere & Co. "In this environment, we have no choice but to keep our own costs in line."

But simple frugality isn't all that management and stockholders are interested in. They are also looking for information weaponry to use against increasingly aggressive competition.

Rodger Marticke, principal of the motor carrier practice at Mercer Management Consulting in Lexington, Mass., observed that "the cargo shipping wars are, in large part, being waged vis-a-vis IS." So, in fact, are the retailing wars, the automotive wars, the financial services wars and so on.

For better or worse, companies' awareness of IS has grown to the point that top executives expect their IS staffs to redesign processes and produce systems that offer a real competitive advantage. Eighty-five percent of the *Premier 100* leaders say they have redesigned some processes over the past year to take advantage of information technology; 80% say they have installed systems to provide competitive advantage.

Handling these critical tasks on top of the normal work load has stressed the resources of even the IS organizations

PETROLEUM AND CHEMICALS

1. Phillips Petroleum Co.
2. The Dow Chemical Co.
3. FMC Corp.
4. Unocal Corp.
5. Union Texas Petroleum Holdings, Inc.
5. Monsanto Co.
7. Ashland Oil, Inc.
8. Rohm and Haas Co.
9. NERCO, Inc.
10. Air Products and Chemicals, Inc.

PHARMACEUTICALS AND FOOD

1. Merck & Co.
2. Schering-Plough Corp.
3. Becton, Dickinson & Co.
4. Sara Lee Corp.
5. International Multifoods Corp.
5. Pepsico, Inc.
7. Bristol-Myers Squibb Co.
8. Upjohn Co.
9. Abbott Laboratories
10. Johnson & Johnson

RETAILING AND WHOLESALING

1. Wal-Mart Stores, Inc.
2. Sears, Roebuck and Co.
2. The Home Depot, Inc.
4. FoxMeyer Corp.
5. Dillard Department Stores, Inc.
5. Kmart Corp.
7. Bergen Brunswig Corp.
8. Winn-Dixie Stores, Inc.
9. Toys R Us, Inc.
10. Nordstrom, Inc.

TRANSPORTATION

1. AMR Corp.
2. Airborne Freight Corp.
2. Roadway Services, Inc.
4. Northwest Airlines
5. J. B. Hunt Transport Services, Inc.
5. International Shipholding Corp.
7. Federal Express Corp.
8. Hawaiian Airlines
9. Carolina Freight Corp.
10. Southwest Airlines

UTILITIES

1. MCI Communications Corp.
2. Bell Atlantic Corp.
3. Carolina Power & Light Co.
4. Southern Co.
5. Northeast Utilities
6. Ameritech Corp.
7. Duke Power
8. Baltimore Gas & Electric
9. GTE Corp.
10. AT&T

at these top companies. Among the chief challenges for *Premier 100* IS execs this year were reducing costs, managing more work with the same resources, educating business users, meeting strategic corporate objectives and downsizing.

The expectations for next year are very similar, except that implementing effective process improvement and networking strategies jumps to the middle of the list.

Unifying LANs and installing T1 lines are already high priorities at many of the *Premier 100* companies, which see tighter communications links with customers and suppliers as an absolute necessity.

STABLE BUT GUARDED

After experiencing a budget free-fall in 1991, *Premier 100* IS groups, particularly in Consumer Products and Financial Services, regained some ground in 1992

Premier 100 companies' cumulative IS budgets (in billions)

*Projected

At retailer Nordstrom, Inc., for example, data processing manager Charles T. Mitchell says that partnering with suppliers has become the key to success in retailing. He points to the company's new VIP Express E-mail system as an example of how Nordstrom is trying to strengthen its supplier relationships. VIP Express gives suppliers fast and easy access to Nordstrom's geographically scattered buyers.

Fully 70% of the companies surveyed have already downsized to smaller platforms; the most frequently cited reason for this move is cost-effectiveness. Hand-in-hand with platform reduction goes the desire to move to nonproprietary systems. Seventy-eight percent of the executives say they installed some nonproprietary systems last year, and 77% say they are planning to install such equipment during the coming year.

The most prevalent theme is the IS chief's great concern with concentrating energies in areas that will produce economies and offer some appreciable business advantage.

In most instances, this means focusing on applications that will increase value to customers — rapid response and fast fulfillment systems, information-on-demand systems, customer service systems and high-level sales and marketing automation systems that provide companies with information their customers need and want.

Client/server systems, electronic data interchange (EDI) technology and networks all play major parts in achieving those goals. None come cheap enough that new infrastructures and systems can be built without some sacrifice. Intelligent trade-offs have become very important — perhaps even the single most important item separating successful CIOs from unsuccessful ones.

Some examples of how *Premier 100* IS leaders are prioritizing and allocating resources include the following:

■ Johnson Controls, Inc.'s James J. Kerwin, director of information technology services for the controls group, says he is reducing spending on maintenance of old systems to concentrate resources on "systems that touch the customer directly, such as order entry."

■ At Caterpillar, Inc., Robert Roof, business manager of corporate information services, is hoping to eke out money for systems to support faster delivery by cutting back on support services, which now consume 60% of the central IS budget.

■ At Airborne Freight Corp., minor or cosmetic changes to existing systems, such as alterations to report formats, are absent from the priority list. This year, the emphasis is on continued improvements to Airborne's EDI systems, which are the technological building blocks for all its customer service programs.

■ In most financial services companies, McKinsey & Co. principal William M. Saubert says, the spending emphasis is now on "the desktops of traders and underwriters, property and casualty adjusters, customer service reps of mutual fund companies and branch personnel." Back-office operations are being consolidated, scaled back and moved out.

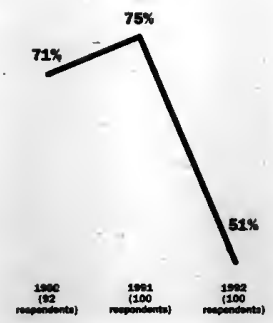
Outsourcing is an option that almost every firm has considered and a significant number have actually pursued, particularly in beleaguered industries such as financial services, petroleum and chemicals and aerospace.

Among *Premier 100* companies in aerospace alone, for example, General Dynamics Corp. outsourced its entire computing operation to Computer Sciences Corp.

BACKING OFF THE EDGE

The importance of leading-edge systems to organizations has dropped 24% since last year

Percent of respondents who said leading-edge technology is critical or important to their organizations



this year. And Martin Marietta Corp. outsourced maintenance of its dedicated telephone circuits to AT&T.

An even more popular option is data center consolidation. Forty-six percent of *Premier 100* companies have already combined some centers, and 59% say they expect to do so in the coming year.

However, neither of those cost-saving alternatives comes close to the appeal of downsizing, which not only permits more flexible access to information but also gives IS departments an opportunity to lower expenditures on central maintenance and support.

At Unum Life Insurance Co., for exam-

ple, CIO John Alexander describes retraining mainframe developers to handle PC development tools and educating users to function in "quasitechnical" roles. And at Union Texas Petroleum, some systems are being migrated to PC LANS, so that business departments can handle more of their own ad hoc report generation.

Right now, the technologies concerning most IS leaders are not artificial intelligence, pen-based computing, multimedia or any of the more glitzy day-after-tomorrow-type tools. In fact, the number of *Premier 100* companies rating leading-edge technology as a "critical" concern has declined precipitously in the last year (see chart page 6).

What top IS executives are more concerned about right now is figuring out what they need to do to make a bottom-line contribution to the business and locating the technologies that will help them solve today's problems.

Derek Mumford, vice president of information techoologies at Eaton Corp., an OEM supplier of truck and automotive parts and appliances, gives voice to this sentiment. "We have to build on our core skills and stick to the things we do well," he says. "There are areas in which we will not be world-class."

Many *Premier 100* companies are concentrating on enhancing existing systems for EDI or, in paper-intensive industries, investiog in imaging systems. The emphasis is on streamlining production and order fulfillment, improving communications with customers and distributing information more effectively.

What they'd really like more of right now, many say, are better data and systems management tools for distributed platforms.

In terms of the departments and applications receiving attention, traditional back-office areas such as fioance or personnel take a back seat to sales and marketing, manufacturing and distribution. And of those, sales and marketing take the lion's share.

In most instances, the goals of these efforts range from cementing customer loyalties to finding new and improved ways to analyze information captured in the marketplace for better product planning.

At Gillette, improved analysis of point of sale data is a key target. Gillette is already using this data to anticipate customer replenishment needs and fine-tune merchandising strategies. However, Herbert Moller, director of systems operations, says he believes that better systems could produce much more actionable information. "We need to translate it [the information] into something we can act on," Mollet says.

In the transportation sector, things have gone one step further. For example, companies are creating new information-based services that can be sold to existing customers interested in outsourcing some of their owo high-overhead, low-return functions.

No matter what the exact strategy or whether budgets at their company increased or decreased, all *Premier 100* IS executives know two things: They are finally in the thick of the business, and the measure of success these days isn't how much iron you control, but how well you can answer the question, "What have you done for the bottom line lately?" ■

PEERLESS PERFORMERS

The following companies received the highest ratings among their industry peers. Four new companies made the ranks this year.

INDUSTRY	COMPANY
Aerospace	The Boeing Co.
Consumer Products and Services	Procter & Gamble Co.
Financial Services	Banc One Corp.
Industrial and Automotive Products	Ingersoll-Rand Co.
Manufacturing	Inland Steel Industries, Inc.
Petroleum and Chemicals	Air Products and Chemicals, Inc.
Pharmaceuticals and Food	Johnson & Johnson
Retailing and Wholesaling	Wal-Mart Stores, Inc.
Transportation	Federal Express Corp.
Utilities	Duke Power

There is perhaps no greater honor than to be called "the best" by your toughest competitors. The IS organizations named above were accorded that honor by other major players in their industries surveyed for the peer rating component of the *Premier 100* selection process.

The top reasons given by the IS executives who named these companies are as follows: The firms use information systems most effectively for competitive purposes; they are an outstanding example of how IS can be integrated into company strategy; they obtain the best bottom-line advantage from information systems; and they combine cost-effectiveness with savvy applications strategies. ■

CONSULTANTS RANK PREMIER 100 LEADERS

Leading IS consultants were asked to pick who they thought were the most effective users of information systems among the *Premier 100* target group of 600 companies. Their selections, which were not included in the *Premier 100* scoring system, agree with the peer selections of industry leaders in the cases of AMR Corp., Banc One, Boeing and Wal-Mart Stores. But they vary greatly after that, with AT&T, The Dow Chemical Co., Ford Motor Co., General Electric Co., Humana, Inc. and Merck & Co. rounding out the rest of the 10 industries. All but GE made the Top 10 within their industry in this year's *Premier 100*. ■

Contrary to popular opinion,

we like

mainframes.

©1992 Sun Microsystems, Inc. Sun, Sun Microsystems, and the Sun logo are trademarks or registered trademarks of Sun Microsystems, Inc. All other products or service names mentioned herein are trademarks or registered trademarks of their respective owners.

We're some of their biggest supporters.

It may sound odd for a $3.6 billion company known for client-server computing to express support for mainframes.

The fact is, however, that business still relies on mainframes for running major applications. And we know it.

But business need oot rely oo mainframes exclusively. Those MIS managers who have seen the future recognize that many maioframe applications, like databases, can be safely distributed throughout the company, close to the people who actually use them.

It's that vision of client-server computiog that we at Sun™ have made practical today. Already, we are helping companies like Kodak, Salomon Brothers and US WEST position their computing for lower costs and higher productivity. By working with existing mainframes, and distributing applications with Sun workstations and servers.

The results: flexible computing, higher profits, quicker response time.

Sound intriguing? To learn more, simply call 1-800-426-5321, ext. 500. We think you'll hear a very supportive story.

Sun

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc Business

Do it smart and do it *once*

Beleaguered industry emphasizes streamlining and waste reduction

BY KATHLEEN GOW

COLLINS *says applications are Boeing's future*

The last 12 months have been a rough ride for the aerospace industry. While the U.S. defense budget continued to shrink, the commercial airline industry posted one of its worst years in 1991. Despite a couple of bright spots — a $1.6 billion increase in spending for the Strategic Defense Initiative and expected increases in NASA outlays — contraction remains the primary mode in the more defense- and government-oriented sector.

Foreign competition is also a growing factor. U.S. share of the worldwide aerospace market has slipped considerably during the past few years, from 73% in 1985 to 58% in 1990, according to the Aerospace Industry Association of America.

In the commereial sector, The Boeing Co. still dominates, with about 60% of the world market for commercial aircraft. But McDonnell Douglas Corp. was displaced from its traditional No. 2 spot by Airbus Industries, the European consortium financed by the governments of France, Germany, Spain and the UK.

Information systems organizations are feeling the effect of business downsizing. Many have lost budget ground, and most are operating in cost-cutting mode. Data center consolidations are common, and a number of companies have outsourced some significant IS functions.

Despite these economies, *Prémier 100* aerospace companies still see IS as the key to enhanced efficiency and profitability through diversification.

Heavy stress is being placed on distributed processing. According to Norm Collins, vice president and general manager of IS at Boeing, client/server platforms are seen as the future there. "For new applications, especially where we are making dramatic process changes, we almost always favor a distributed architecture because it brings more graphics functionality to the table."

KEY TECHNOLOGIES

NOW
- LAN applications
- MRP II
- Imaging applications
- Software development

NEXT FIVE YEARS
- Open systems
- CIM

1

The Boeing Co.

Seattle-based Boeing, the world's leading manufacturer of commercial aircraft, is also the leading manufacturing exporter in the U.S. With an order backlog of about $90 billion, the $29 billion company is in no danger of being edged out of the sky.

If cutbacks in Northrop Corp.'s B-2 bomber program — for which Boeing is a subcontractor — and drops in orders for 737s have caused a pinch, Boeing was not about to let IS feel it. In fact, the company bucked the industry trend in 1991 by increasing its IS budget 23% to $1.6 billion. IS staff grew 4% to top 14,000, while installations of personal computers and terminals grew 18% to 122,600. These IS investments were partially fueled by the ramp-up of Boeing's 777 passenger plane program, due for delivery in 1995.

The wide-body, two-engine 777 is being built with the help of three-dimensional computer-aided design (CAD), which Collins says means far

PHOTOGRAPHY BY RICH FRISHMAN

The Premier 100

fewer mistakes and significant savings from reduced cycle time.

2 Grumman Corp.

Grumman, a $4 billion company in Bethpage, N.Y., is responding to defense cuts by using systems technologies to drive costs down and functionality up. The company's strategy is based on high-powered workstations in a distributed environment, extensive use of imaging and links between local- and wide-area networks to handle high-speed, high-volume transactions.

Like most of its competitors, Grumman trimmed its 1992 IS budget. A 4% cut brought the funding level to $153 million, and the IS staff was cut by 25% to 1,500. Grumman is currently examining how it delivers services to internal customers to ensure that its practices and procedures align directly with business needs.

The company has centralized many shared services during the last several years by consolidating data centers. Most application, workstation and PC areas have remained decentralized, but the company is looking at further consolidation to eliminate redundancies and streamline operations.

3 McDonnell Douglas Corp.

McDonnell Douglas, the top U.S. defense contractor and the world's third-largest maker of commercial aircraft, responded to declining industry revenue with major IS initiatives centered around cost. The $18.7 billion company has been examining architectural options for the last several months, including increased reliance on Unix-based workstations. It has also been weighing the possibilities of outsourcing data center or application development services.

Last fall, McDonnell began a year-long data center consolidation, which will fold seven operations into two.

McDonnell's IS budget slipped 2% in 1992 to $683 million, while IS staffing fell 5% to 3,500. Support for training stayed strong, however, as did the company's commitment to end-user computing.

INDUSTRY LEADERS

1. **Art Hitsman**
   President, Boeing Computer Services
   The Boeing Co.
2. **William D. Rizzardi**
   Corporate V.P., Information Management
   Grumman Corp.
2. **Leonard J. Deroy**
   V.P., Information Resource Management
   McDonnell Douglas Corp.
4. **Raymond J. Wiltshire**
   V.P., Computer-Aided Productivity
   Martin Marietta Corp.
5. **Dean O. Allen**
   V.P., IS
   Lockheed Corp.
6. **Robert Sexton**
   Corporate Director, IS
   Raytheon Co.
7. **J. F. Setter**
   V.P. and General Manager
   Rockwell International Corp.
8. **Cecil W. Labhart**
   V.P., IS
   Textron, Inc.
9. **Herbert Anderson**
   V.P. and Center General Manager
   Northrop Corp.
10. **Asaph H. Hall**
    V.P. and General Manager
    General Dynamics Corp.

4 Martin Marietta Corp.

Revenue was flat and profits were down in 1991 at Martin Marietta in Bethesda, Md. With the anticipated cancellation of some of its defense contracts (the Peacekeeper missile and the Air Defense/Anti-Tank system), the diversified aerospace company's plans include aggressive expansion into nondefense markets.

CHALLENGES

- Managing increased user demands
- Customer satisfaction

The company's IS budget for 1992 dropped 6% from the previous year to $301.3 million, and the IS staff was cut 14% to 1,900. The company is moving from a two-tiered (host/workstation) architecture to a three-tiered setup, with many mainframe-based applications moving onto servers.

Martin Marietta is also exploring the use of fiber-optic networks, computer-aided software engineering and rapid application development tools.

5 Lockheed Corp.

Lockheed in Calabasas, Calif., is the leader of the team building the U.S. Air Force's new Advanced Tactical Fighter, the F-22. But the $9.8 billion company's long-term strategy is to decrease its dependence on defense and transfer internally developed IS skills and expertise into commercial endeavors.

The major challenges for IS are to reduce service delivery costs while using technologies such as imaging and expert systems to improve performance and cost-allocation processes.

In a major cost-cutting initiative, Lockheed established a company called Lockheed Information Technology to consolidate the company's large-scale and high-performance computing services in one world-class data center. By eliminating duplications of platforms, software and services, the company predicts an annual savings of 25% to 30%. The consolidation will take place during the next 18 to 24 months.

6 Raytheon Co.

Although most widely known as a missile and radar provider, Raytheon also produces commercial aircraft

(Beech), manufactures appliances, builds chemical and power plants and publishes books. This diversification into commercial markets has helped the $9.4 billion company insulate itself from the effects of defense cuts. Still, the downturn in defense business has brought changes.

Raytheon has steadily reduced its IS staff during the past several years, and the head count dropped another 7% this year to 1,150. This year the IS budget also fell sharply, dropping from $197 million in 1991 to $105 million in 1992.

Raytheon's strategies to stay lean and mean include standardization of systems, consolidation of resources (it is folding an IBM 3090-class computer center in Waltham, Mass., into another in nearby Andover), the purchase of remarketed systems and investment in "paperless" design and procurement systems. The company has also started scanning "legacy" engineering drawings into image-based systems with new drawings going directly to electronic media via CAD.

7 Rockwell International Corp.

Despite defense industry woes and the completion of its Endeavor space shuttle, top NASA contractor Rockwell International increased its IS budget 10% to $285 million for 1992. That increase helped to fund a number of important technology initiatives, such as enhancing systems for materials management and integrating engineering and manufacturing databases into a single large system called the Enterprise Product Data Management.

Rockwell is also replacing large-scale and midrange computers with reduced instruction set computing (RISC)-based workstation technology and increasing its use of imaging technology to facilitate cooperation with customers and partners in product design and manufacturing.

Despite the IS budget increase and Rockwell's unflagging commitment to training, IS is not exempt from the need to watch costs. Staff in that area was cut 10% in 1992 to 2,464, reflecting the consolidation of two data centers. Sales declined 3% in 1991 to just over $12 billion, and profits fell 4% to $601 million. Overall employee head count dropped 15% to 87,000.

DEFINING REALITIES

BUDGETS
Well over three quarters of the leading aerospace companies said their budgets decreased last year, and most expect further reductions.

PRESSURES
Shrinking defense dollars are causing companies to closely examine IS and cut back or outsource where they can. Process redesign and downsizing are also being considered.

ORGANIZATIONAL CHANGES
Well over three quarters of these companies have a mixture of centralized and decentralized IS operations. Most of these companies plan to consolidate or merge data centers in the coming year.

PLATFORM CHANGES
Aerospace leads the way in the move to smaller platforms.

8 Textron, Inc.

The economy was good to Providence, R.I.-based Textron in 1991: the company recorded a net income for the year of $300 million, up 6% from the year before, and the result for IS was a $169 million budget for 1992.

The company's 35 subsidiaries fall into three sectors: aerospace technology, commercial products and financial services, split evenly between defense and commercial markets. The company acquired Cessna Aircraft Co. in Wichita, Kan., this spring from General Dynamics for $600 million.

Textron Aerostructures, which manufactures wings and wing components, has shifted emphasis from mostly defense sales three years ago to about 80% commercial aerospace sales today. Through total quality management programs and an employee-supported asset management program, Textron hopes to reduce cycle time.

9 Northrop Corp.

In 1991, Los Angeles-based Northrop saw additional cuts to its flagship B-2 Stealth Bomber program and a lost bid to build the Air Force's Advanced Tactical Fighter in partnership with McDonnell Douglas.

The $5.7 billion company has been reshaping itself for leaner times and greater flexibility for some time, however. In 1991, it instituted a number of changes in its IS organization, which saved $25 million. These included consolidating and centralizing the responsibilities of the IS vice presidents who used to manage each of the company's Southern California locations, consolidating its applications, programming and telecommunications groups and reducing the number of large mainframes from 31 to eight.

Savings of another $25 million are projected for this year. Northrop is also putting together a five-year technology architecture plan to move toward a client/server environment.

10 General Dynamics Corp.

General Dynamics moved back into the Top 10 this year, after falling to No. 12 in 1991 and holding the No. 1 spot in 1990 and 1989. It was a busy year for the company, moving its headquarters from St. Louis to Falls Church, Va., last January. Chairman Stanley Pace retired in 1991 and was replaced by William A. Anders.

To counter the reduction in defense spending, $9.5 billion General Dynamics is withdrawing from noncore markets, reducing risk and, where possible, replacing fixed costs with variable ones. It sold its Cessna Aircraft subsidiary to Textron and its missile systems divisions to Hughes Aircraft Co. It also outsourced its computing operations to Computer Sciences Corp. (CSC) in November 1991 under a 10-year, $3 billion agreement.

CSC is providing General Dynamics' aerospace and defense units with systems development, data center management, network operations and other technical services. In an initial six-month review, users said the change has been totally transparent.

General Dynamics is pursuing improvements in cash flow and cost control through electronic data interchange and materials management. ■

Gow is a free-lance writer based in Medford, Mass.

Consumer Products and Services

Catering to the customer

Well-stocked store shelves keep retailers happy

BY BARBARA FRANCETT

READER'S DIGEST'S *Nelson leads IS globalization effort*

INDUSTRY LEADERS

1. **Kenneth A. Nelson**
   V.P., MIS
   Reader's Digest Association, Inc.
2. **F. R. Caccamo**
   Manager, Management Systems Division
   Procter & Gamble Co.
2. **R. William Eaton**
   CIO and Senior V.P.
   Levi Strauss Associates, Inc.
4. **Herbert Meller**
   Director, Systems Operations
   Gillette Co.
5. **Leonard L. Hendrickson**
   Director, IS
   American Brands, Inc.
5. **Michael S. Field**
   Executive V.P.
   The Dun & Bradstreet Corp.
7. **Edward J. Heresniak**
   Senior V.P., Computer Services
   McGraw-Hill, Inc.
8. **Thomas J. Gildea**
   V.P., Business IS
   Helene Curtis Industries, Inc.
9. **Fred Pirman**
   Senior V.P., IS
   Humana, Inc.
10. **James J. Kerwin**
    Director, IS
    Johnson Controls, Inc.

Always competitive, the consumer products industry is now downright predatory. Companies are trying everything to increase market share.

In most instances, the best way to wrest share away from the competition is by gaining the retailers' favor. Consumer products companies are attempting to do that by improving delivery efficiency and shouldering a number of tasks, including product ordering, inventory management and payment processing. Procter & Gamble Co., for instance, has taken over purchasing and inventory management for its products at Wal-Mart Stores, Inc. sites.

Collection and analysis of point-of-sale (POS) data contributes to another strategy that's gaining momentum in the consumer products industry: micro merchandising, or the ability to integrate fine-grained information from a number of sources to determine where a product is most likely to sell and what combination of products is best for specific locales.

1

Reader's Digest Association, Inc.

Global unity is the theme these days at Reader's Digest in Pleasantville, N.Y., which, with its range of direct marketing businesses, is actually its own best information customer. "Our businesses around the world have been operating independently. Now, a two-year program is under way to globalize the business," says Kenneth A. Nelson, vice president of MIS.

The $2.4 billion publisher and direct-mail marketer operates in more than 50 locations worldwide. It publishes its namesake magazine in local editions around the world rather than

Continued on page 16

PHOTOGRAPHY BY JOYCE RAVID

Salomon Brothers

Global trading
Global networking
Client driven
2,000 Sun workstations and servers.

©1992 Sun Microsystems, Inc Sun, Sun Microsystems, and the Sun logo are trademarks or registered trademarks of Sun Microsystems, Inc All SPARC trademarks, including the SCD Compliant logo, are trademarks or registered trademarks of SPARC International, Inc SPARCstation is licensed exclusively to Sun Microsystems, Inc Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc All other products or service names mentioned herein are trademarks or registered trademarks of their respective owners

In the competitive world of global finance, the ability to respond to your clients' needs and to the demands of the marketplace are the critical factors for success.

In 1989, Salomon Brothers, a leading investment banking and securities institution, made a strategic decision to transform their technology infrastructure. This decision, involving distributed systems design and Sun Microsystems,® gave Salomon a competitive edge.

Linked globally through Salomon's internal network, hundreds of salespeople, traders, research analysts and support professionals are linked together 24 hours a day—every market day.

This system was built by Salomon with Sun™ SPARCstations™ and servers as the information delivery platform of choice.

If you would like to gain your own competitive advantage, call Sun Microsystems at 1-800-426-5321, ext. 500.

Sun

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc. Business

Continued from page 13

translate a U.S. version. The local editions feature local advertising, and the reader responses to those ads are fed into databases for direct marketing of other products such as books and home video packages.

This year's $120 million information systems budget (up from $98 million last year) is earmarked for a five-part program that began last year, which includes an international communications network and the creation of a portfolio of common business applications.

CHALLENGES

- Moving more quickly to production
- Process improvement

3 Levi Strauss Associates, Inc.

Consumers can't buy apparel that isn't on the racks, so Levi Strauss emphasizes paring product delivery times to keep enough merchandise available to meet consumer demand without piling up excess inventory.

Order, inventory and delivery management are the goals of the LeviLink system, which connects Levi Strauss to its suppliers and trading partners.

Making sure that the information collected using LeviLink is then applied to turning out deliverable products is the job of another internal system, Levi's Advanced Business System.

KEY TECHNOLOGIES

NOW
- DBMSs
- LAN applications
- Networks

NEXT FIVE YEARS
- Sales force automation
- Client/server systems
- Open systems

On the manufacturing side, computer-integrated manufacturing, including computer-aided design and manufacturing systems, cuts production time and speeds merchandise out of the plant.

Bill Eaton, senior vice president and chief information officer at the San Francisco-based company, says the differentiator between Levi Strauss and some of its competitors is not that it uses information technology that is so much more advanced but that it applies IS to "the full array of business processes."

CONSUMER PRODUCTS *companies use IS to compete for limited shelf space*

2 Procter & Gamble Co.

Procter & Gamble has forged strong partnership arrrangements with its retailers through swift responses in product replenishment and a variety of technology-supported value-added services.

For customer/partner Wal-Mart, Procter & Gamble handles inventory management and purchasing for some of its products. It also uses Wal-Mart's POS data to replenish stock automatically.

Long known for its outstanding brand management capability and market research, Procter & Gamble has shown interest in expanding its global presence by tapping developing markets in eastern Europe, Latin America and the Far East. The $27.4 billion company spends $237 million on IS.

4 Gillette Co.

This $4.7 billion Boston-based maker of personal care products derives more than 65% of its sales income from overseas markets. Corporate IS sets strategic directions for its far-flung business units, each with its own IS operations support.

Gillette's IS budget — about $120 million this year — continues to grow. During the past year, developing business units in Latio America, Asia and the Pacific Rim have concentrated on establishing client/server computing systems and using off-the-shelf software packages wherever possible, according Herbert Moller, vice president of corporate MIS. Moller notes that it is easier to "start fresh" with newer units.

Business units in the more mature competitive markets of the North Atlantic region are focusing on technologies that support distribution and logistics, such as electronic data interchange and POS data collection and analysis.

5 American Brands, Inc.

The chief IS challenge at this highly diversified, $8.4 billion company is to formulate specific responses to the unique competitive conditions in each of its five core businesses: American Brands and Gallaher Ltd. tobacco products, Jim Beam Brands Co. distilled spirits, Master Brands Industries hardware, ACCO World Corp. office products and Franklin Life Insurance Co.

While each company functions autonomously with a distinct IS group and strategic business plan, all benefit from

PHOTOGRAPHY BY GERARD FRITZ/TONY STONE WORLDWIDE

volume purchase agreements for hardware, software and services, says Leonard Hendrickson, director of IS.

The Master Brands Industries hardware and ACCO office products companies concentrate their technology investments on efficient customer support systems, including inventory control, warehouse management and distribution systems. The American Brands and Gallaher tobacco products companies have focused on improving their manufacturing support systems with more sophisticated manufacturing resource planning systems as well as handheld computers.

6 The Dun & Bradstreet Corp.

If there's a word that characterizes Dun & Bradstreet this year, it's "transition." Following several years of double-digit growth, the $4.6 billion diversified financial information provider experienced a decline in earnings last year. It responded by reorganizing and pruning business units and by cutting costs. Nevertheless, Dun & Bradstreet is steadfast in its commitment to technology.

The company's business information group continues to aggressively pursue ways to leverage Dun & Bradstreet's vast information resources and to provide lower cost, real-time information services to its directory, marketing and financial information services customers.

7 McGraw-Hill, Inc.

Technology provides the underpinnings for the varied publishing and information services businesses of McGraw-Hill in New York.

"Our four corporate goals are to grow the business, use technology to leverage the business, expand globally and cut costs," says John Dobilas, senior vice president of IS and technology.

Two groups, the Technical Advisory Committee and the Applications Coalition, enable the company's businesses to share applications, design information and maintain compatibility so that solutions are transferable among businesses.

Despite a flat overall IS budget (an estimated $166 million), several important projects were launched in the past year. Financial services company Kenny S&P, for example, reduced its large-scale platforms to small, multivendor client/server systems with Unix processors and graphical user interfaces and, based on the results at that unit, client/server systems are being rolled out to other groups.

8 Helene Curtis Industries, Inc.

Since all growth at Helene Curtis is internally generated (no acquisitions of companies or brands), its market share in the hotly competitive personal care segment must be earned. Right now, the company is trying to earn its share by beating the competition at logistics management, particularly order processing and distribution.

DEFINING REALITIES

BUDGETS
Well over half the companies in this category increased IS budgets this year, and slightly over half of the IS managers expect another increase next year.

PRESSURES
Well over three quarters said they were under increased scrutiny from the top executives and shareholders this year. Application development backlog is a significant concern, with just under half of the companies surveyed reporting that it had worsened over the past year.

ORGANIZATIONAL CHANGES
Decentralization of IS is prevalent. In fact, this industry has the smallest reported incidence of IS centralization.

PLATFORM CHANGES
Downsizing to smaller platforms is a major trend. Well over three quarters made moves of this type this year, primarily for cost reduction and cost-effectiveness but also to allow greater user involvement.

"The goal is to squeeze as much time out of the order cycle as possible," says Thomas J. Gildea, vice president of business information services.

Recently named Vendor of the Year by Wal-Mart, the company isn't resting on its laurels. A hefty increase in the IS budget — up 10% to $30 million — is being directed toward technology investments that will improve service. For example, enhancements are being made to the sales information system, which will allow representatives to offer immediate competitive analyses.

9 Humana, Inc.

A flat business cycle has produced lean times at Humana, a Louisville, Ky.-based health care company. The company, which operates 78 hospitals, has declared a hiatus from acquisitions, which had been a primary source of growth. It is also trying to recover from the migration of some of its patients to lower cost facilities for some treatments.

The IS budget is down to $90 million, representing a reduction of 50% in capital expenditures and of 8% to 10% in operating funds, says Fred Pirman, senior vice president of IS. Several major productivity-oriented initiatives continue, such as an imaging system for insurance claims operations that was recently rolled out to three processing centers.

10 Johnson Controls, Inc.

At Johnson Controls, a Milwaukee-based manufacturer of temperature, lighting and energy controls, as well as automotive systems, plastic containers and automobile batteries, IS has focused on aligning its goals with business strategies.

"There was a bit of disconnect between IT's directions and priorities and those of the business," says James J. Kerwin, director of information technology services at the controls group. To address that problem, the company enlisted external consultants to help map its technical infrastructure and organized cross-functional project teams of business and IS staff members.

Future strategies will continue to emphasize responsiveness to customers, Kerwin says, and phasing out legacy systems is on the near-term agenda. ■

Francett is a free-lance writer based in Bloomfield, N.J.

Financial Services

Growth is relative

Budgets are bigger, but so are expectations

▸ BY ALICE LAPLANTE

After four years of multimillion-dollar losses and bad loan write-offs, the financial services industry is at last showing signs of revival. Revenue — and more importantly, profits — is up at the leading financial institutions.

That sounds like good news for information systems managers, and it is . . . sort of. Although the strongest financial institutions have indeed increased budgets — and, to a lesser degree, head counts — many, especially banks, have also absorbed dozens of other institutions. In other words, slightly more money and personnel are being stretched over a lot more territory.

IS staffs at the top companies are being asked to develop systems and architectures that will allow efficient and cost-effective servicing of expanding customer populations and to provide products of a consistently high quality at a lower per-unit cost.

There's one story that all *Premier 100* financial services firms tell: how they are slashing costs in back-office operations to put money and personnel into all-important front-office development efforts.

Self-service technologies are also a major focus of systems efforts. Financial services firms, for example, are moving strongly into systems that allow customers to use telephone and home computers to access accounts.

1 J. P. Morgan & Co.

Earnings at the global holding company, which provides a wide range of banking, underwriting, trading and investing services to corporations, governments and individuals, rose an astonishing 44% in 1991, for a net income of $1.1 billion.

With its 1992 IS budget of $510 million, J. P. Morgan is pursuing a two-part goal: reduce costs wherever possible and funnel dollars into development of desktop systems. That was the impetus for the outsourcing arrangement with BT North America, Inc., which is expected to save more than $12 million over five years, and the decision to consolidate support for London and Paris operations into the data center in Delaware.

Savings from such moves are being used to develop sophisticated local-area network-based front-office applications around the world. Morgan just completed a major project connecting its international office LANs and is developing a Unix-based securities processing system that will allow dealers to input trades on the desktop and automatically reconcile host-based transaction processing systems.

Last year, J. P. Morgan established an advanced technology group. The major challenge now is training IS employees on Unix, LAN and emerging object-oriented technologies.

INDUSTRY LEADERS

1. **Peter L. Woicke**
   Managing Director
   J. P. Morgan & Co.
2. **Richard F. Morrison**
   Senior V.P. and CIO
   Primerica Corp.
3. **Robert L. Barrett**
   President, Banc One Services Corp.
   Banc One Corp.
4. **Robert N. Gilmore**
   Executive V.P., Technology
   CoreStates Financial Corp.
5. **F. J. Ward**
   Executive V.P., Operations
   KeyCorp
6. **Martin A. Stein**
   Executive V.P., CIO
   BankAmerica Corp.
7. **Jonathan Palmer**
   Chief Technology Executive
   Barnett Banks, Inc.
8. **John J. Alexander Jr.**
   CIO
   Unum Life Insurance Co.
9. **Carmine Vona**
   Executive V.P.
   Bankers Trust New York Corp.
10. **John J. Pajack**
    Executive V.P.
    Massachusetts Mutual Life Insurance Co.

2 Primerica Corp.

The expressed goal of Primerica, a $21.5 billion consumer finance, investment and insurance services company, is to be a low-cost provider in realms that include consumer lending, investment banking, securities brokerage, asset management and personal and property insurance.

Achieving this means maintaining a low-cost corporate culture everywhere, including IS. In 1992, Greenwich, Conn.-based Primerica continued its consolidation of data centers by folding six corporate centers into four. It also moved a number of strategic host-based systems onto LANs. To control costs, business managers have bottom-line responsibility for application development projects.

A variety of client/server projects are under way, including a commercial credit system that will move intelligent processing out to branch offices. Funding continues for investigating emerging technologies such as imaging, which may help to further reduce costs.

3 Banc One Corp.

IS helped Columbus, Ohio-based Banc One make 1991 its most successful year ever. With profits up 25%, the retail banking giant continued rapid growth by acquiring new banks at an average rate of one per month, and it ended 1991 with assets exceeding $46 billion.

A SWAT team of 150 conversion experts from Banc One Services Corp., the IS arm of Banc One, descends on new acquisitions and converts them to standard Banc One hardware and software literally overnight. With an IS budget of $293 million and 1,650 employees, Banc One Services offers acquired banks IS services and support at 90% of market price, in addition to providing credit-card and check processing/settlement for credit unions, brokerage houses and nonaffiliated banks.

Last year, Banc One began implementing a suite of client/server applications called the Strategic Banking System. Co-developed with Electronic Data Systems Corp. at a reported cost of more than $100 million, this enhanced customer service system has so far resulted in 10% to 20% savings.

4 CoreStates Financial Corp.

CoreStates Financial Corp is using technology to help it expand in all of its main businesses: wholesale banking, retail banking, trust and investment banking and electronic payment services. Last year, Philadelphia-based CoreStates doubled business handled by its electronic payment services group by acquiring BuyPass the System, Inc., the largest third-party provider of processing services for point-of-sale transactions.

The company, which is growing its international business at a 30% annual rate, also redesigned its international processing systems by defining a distributed architecture for all offshore operations.

CoreStates intends to put $103 million into IS spending in 1992 — a figure that is slightly up from the previous year — and hold IS staffing steady at 700 employees.

J. P. MORGAN'S WOICKE balances cost reduction with strategic investment

CHALLENGES

- Cost reductions
- Managing more work with same resources
- Remaining technologically effective

KEY TECHNOLOGIES

NOW
- Imaging applications
- Expert systems
- Telecommunications

NEXT FIVE YEARS
- Client/server systems
- EISs

5 KeyCorp

IS is literally part of the company's growth strategy at KeyCorp. When KeyCorp, one of the fastest rising financial holding companies in the country, is considering an acquisition, it sends in an advance analysis team that includes senior IS executives. Their job is to determine whether a smooth and cost-effective systems consolidation is possible.

IS hasn't been forgotten in terms of funding, either. Its budget will be a healthy $48.7 million in 1992, up $8 million from 1991. Staffing is up, too. When KeyCorp acquired Gold Dome Savings Bank in Buffalo, N.Y., last year, it retained the programming staff to help meet a growing backlog.

During the past year, roughly half of KeyCorp's systems and programming resources were spent on converting acquired banks to the KeyCorp systems architecture.

6 BankAmerica Corp.

Consolidating gains has been the emphasis at BankAmerica since its $4.4 billion acquisition of Security Pacific Corp. Absorbing, standardizing and

PHOTOGRAPHY BY JOYCE RAVID

streamlining are still big chores for IS. In 1992, BankAmerica sold its $125 million payroll processing unit to ADP Network Services, which cleared the decks for large-scale systems development projects made necessary by the merger.

Although BankAmerica's 1992 IS budget has not been finalized, the goal is to cut 25% from the combined spending of the two institutions. One major step was the consolidation of Hong Kong and Frankfurt data center operations into a center in Croyden, England, at an estimated savings of more than $1 million per month.

But thrift does not mean inactivity on the development front. Last year, the network systems management group developed a change management tool that simultaneously downloads software to more than 1,000 desktop workstations from the corporate data center in Concord, Calif.

7 Barnett Banks, Inc.

The IS arm of Jacksonville, Fla.-based Barnett Banks has set a goal of earning $1 for every 60 cents invested in systems.

All IS services for the $43.2 billion bank holding company and its 32 retail banks are provided by a wholly owned $220 million subsidiary, Barnett Technologies, Inc.

The IS group's main strategy is to gradually reduce the dependence of bank operations on expensive, centralized data centers by moving strategic applications to a distributed architecture. More than $50 million will go toward reorganizing all operations around a distributed system built on IBM Token Ring LAN technology. More than 10,000 IBM Personal System/2 machines are scheduled to be in place by the end of this year.

The IS department has also developed a state-of-the-art imaging system for check processing, which will be rolled out during the next five years.

Although the $75 million IS budget is up $20 million from 1991 and the capacity of the data center has been increased threefold in the last two years, Barnett Technologies has reduced its staff by 400 workers, to 3,200, to help meet the profitability goals set by its parent. The bank's profits rose 22% in 1991 to $123.8 million.

DEFINING REALITIES

BUDGETS
The number of companies reporting IS budget increases actually ran well ahead of the average for all industries surveyed, and more than three quarters anticipate increases next year.

PRESSURES
Resources are being claimed by systems deemed to offer competitive advantage. The vast majority of companies said they had installed systems of this type over the past year. At the same time, 100% said they had evaluated outsourcing.

ORGANIZATIONAL CHANGES
More than half of the companies report having consolidated some data centers this year. More than three quarters expect to do so next year.

PLATFORM CHANGES
More than half said they've done some downsizing over the past year, but this industry is far less active than most when it comes to downsizing.

8 Unum Life Insurance Co.

A specialty insurance company with assets totaling $10.3 billion, Portland, Maine-based Unum is a leader in two relatively underpenetrated markets: disability and long-term care. With relatively little competition, Unum continues to expand rapidly at a time when other insurance firms are struggling. Indeed, Unum's IS staff's biggest challenge is managing growth.

Unum is determined to place more power in the hands of business users. A new OS/2-based client/server claims processing application has been implemented on a Token Ring network, and other plans for cooperative processing projects are on the boards. Business users are receiving tools and training that will allow them to assume "quasi-technical" roles.

9 Bankers Trust New York Corp.

With net income at an all-time high of $667 million last year, Bankers Trust decided the time was right for major changes in systems architecture that would create consistent applications across its decentralized structure. In 1991, the company finished plans for a bankwide architecture that will move the company from a character-based 3270 computing mode to a client/server architecture using graphical user interface systems.

This is the year Bankers Trust will begin worldwide client/server implementation and will interconnect disparate LANs and wide-area networks into a global enterprisewide network.

10 Massachusetts Mutual Life Insurance Co.

Careful and conservative investment practices have helped Springfield, Mass.-based Mass Mutual escape most of the travails that have afflicted the financial services industry. The $5 billion company has the strongest capital base in the industry, as well as top bond ratings from Standard & Poor's Corp. and Moody's Investor Service, Inc. Throughout the organization, which is one of the largest insurance concerns in the country, the emphasis is on frugality and targeted investment.

Last year, Mass Mutual implemented the bulk of its new, multistage Horizon project, which involves overhauling most applications for distributed processing. Eventually, all field and home-office personnel will be tied into a new distributed environment, which includes an on-line link with medical providers, as well as client management and office automation facilities.

A distributed on-line transaction processing system that divides processing between the Springfield data center and a new facility in Ireland was also completed last year. The system has increased insurance claims processing productivity by 40%.

All of this has been accomplished in a year when the IS budget was reduced from $78 million to $71 million. Field maintenance of personal computers and LANs was outsourced at an estimated annual savings of $600,000, and a deal with AT&T is expected to provide volume discounts on voice and data transmissions. ■

LaPlante is a free-lance writer based in Palo Alto, Calif.

Industrial and Automotive Products

New spirit of conservatism

This is not the time for experimentation

BY MARK MEHLER

INDUSTRY LEADERS

1. **Henry Paulsen**
   Director, IS
   Dresser Industries, Inc.
2. **Donald Lee**
   Acting V.P., Worldwide IS
   Black & Decker Corp.
3. **Robert P. Hinds**
   Director, Corporate IS
   Caterpillar, Inc.
4. **Richard Kolbe**
   Director, MIS
   Harley-Davidson, Inc.
5. **Derek Mumford**
   V.P., Information Technology
   Eaton Corp.
6. **S. I. Gilman**
   Executive Director, IS
   Ford Motor Co.
7. **P. F. Ohman**
   V.P., Engineering, Information Technology
   Deere & Co.
8. **Bruce Carlson**
   General Manager, IS
   Paccar, Inc.
9. **John Sanford**
   Director, Corporate DP
   Trinity Industries, Inc.
10. **George Tabback**
    Manager, Corporate DP
    Ingersoll-Rand Co.

DRESSER INDUSTRIES' PAULSEN *targets EDI applications*

When the going gets tough, the tough start thinking. At least that's the philosophy Ford Motor Co.'s Jim Cnossen follows.

This is a time to tap IS resourcefulness, not look for new resources, says Cnossen, manager of the company's North American systems. It is also a time for pursuing practical gains rather than making experimental leaps.

Cnossen's peers at companies in the top ranks of the industrial products and automotive industries all seem to agree. It's better to forgo leading-edge technologies, they say, in favor of more modest systems that reduce costs, improve customer service and shorten delivery cycles.

Most of the *Premier 100* companies in this category have launched extensive electronic data interchange (EDI) programs during the past two years. "In a period of tight money, [EDI] is a perfect fit with the goals of the organization: lower inventories, faster deliveries, just-in-time manufacturing," says Henry Paulsen, director of information services at Dresser Industries, Inc., a Dallas-based oil field equipment supplier that tops the category this year.

Continued on page 24

PHOTOGRAPHY BY DAN BRYANT

In 10 years we've taken UNIX and taught it to speak a new language.

©1992 Sun Microsystems, Inc Sun, Sun Microsystems, and the Sun logo are trademarks or registered trademarks of Sun Microsystems, Inc All SPARC trademarks, including the SCD Compliant logo, are trademarks or registered trademarks of SPARC International, Inc SPARCstation is licensed exclusively to Sun Microsystems, Inc Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc All other products or service names mentioned herein are trademarks or registered trademarks of their respective owners.

The language of Business.

If computers wotking harder and people working smarter are the words corporate managers need to hear these days, theo let us iotroduce you to an operating environment flueot io the language.

Solaris.®

Solaris is a remarkably powerful operating eovironment that allows your computers to work together, your people to work in groups, and your business applications to he run all at the same time.

Built on the powerful UNIX operating system, Solaris adds productivity features such as multiprocessing, ease-of-use through an iotuitive graphical user interface, and the ability to easily administet your entire enterprise.

Mnre than 500,000 systems are already running oo Solaris, making it the world's largest installed UNIX base. Indeed, the Solaris environment is found io every Suo SPARCstatioo™ and SPARCserver.™

And Solaris is fully backed by 550 third-party development tools, and supported by mnre thao 16,000 Customer Support professionals.

All of which, we suggest, makes Solaris not ooly the language nf good busioess computing, but the language of good business sense as well. 1-800-426-5321, ext. 500.

Sun

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc Business

TOUGH TIMES *in the auto industry make IS groups more conservative*

CHALLENGES

- Platform integration
- Networking

KEY TECHNOLOGIES

NOW
- LAN applications
- Networks
- Order and supply-chain applications

NEXT FIVE YEARS
- Distributed RDBMSs
- CIM
- EDI

1 Dresser Industries, Inc.

Continued from page 21

The fourth-largest industrial and farm equipment supplier, Dresser saw its sales rise 4% in 1991, to $4.7 billion. The role of information systems is to provide tools that allow each of Dresser's 20 autonomous divisions to bring in money faster.

Toward this end, the IS group offers EDI as a mainframe service across the entire organization. Currently, departments use it for requests for proposals, customer purchase orders and acknowledgments, confirmed ship dates and purchase orders. "We've eliminated the two-week lead time while the paper was being moved," Paulsen says.

He adds that there is a generalized pressure from internal customers for better processing capability, and the biggest challenge is trying to meet those expectations at lower cost. In 1991, total IS spending was down 10% to $108 million, and he looks for another 10% decline in 1992.

2 Black & Decker Corp.

Rapid response is the magic phrase at Black & Decker. The power tool and appliance manufacturer, which offers 5,000 product lines, is investing in new just-in-time systems and software to speed deliveries.

EDI is a major piece of that plan, says Donald Lee, acting manager of worldwide information services. In the U.S., the firm is implementing EDI between Black & Decker and its customers, while in Europe, it focuses on computerized links between the manufacturer and supplier base.

The allocation of Black & Decker's $80 million 1991 IS budget reflects the new priorities. Although that figure was down 10% from the previous year, the company chose to buy quick response and MRP II applications and make up the difference by reducing expenditures on the operational side (maintenance and support).

3 Caterpillar, Inc.

Caterpillar's 1990 reorganization into 14 profit centers and declining sales and earnings (it lost $400 million in 1991 on sales of $10.1 billion) have resulted in an IS department rebuilt for speed.

Major systems programs now in the works include an effort to link the various engineering groups to shorten the product design cycle and widespread EDI implementation to hasten just-in-time delivery. The company expects to bring 80% of its supplier base onto the system within 18 months.

"Time is money, and in this economy it's critically important that IS find the cheapest ways to bring products to market faster," says Robert Roof, business manager of corporate information services.

IS is cutting back its support spending. "Support currently runs about 60%" of the centralized IS budget, Roof says. "I think our customers can get by with less handholding. We can crank down support spending 5% or 10%."

4 Harley-Davidson, Inc.

Don't talk recession to this manufacturer of motorcycles, recreational vehicles, parts and motorcycle fashion accessories. Demand began soaring late last year — fourth-quarter earnings rose 86% on a 22% jump in sales — and hasn't let up. IS director Richard Kolbe credits improvements in product quality, noting that the overall U.S. motorcycle market is relatively flat.

For Kolbe and his staff, this mini-boom presents an enviable problem: speeding up deliveries to satisfy the pent-up demand of dealers still on allocation.

To accomplish this, Harley has invested in tools such as a commercial inventory planning and forecasting system for use in the repair parts and accessories business.

5 Eaton Corp.

As an OEM component supplier to two recession-blasted industries — auto manufacturing and construction — Eaton is under increasing cost pressure from its customers.

These pressures have prompted the company to accelerate its expansion into

PHOTOGRAPHY BY ANDY SACKS/TONY STONE WORLDWIDE

overseas markets via a bevy of small acquisitions. And IS has come through with new cost accounting systems aimed at ensuring consistency of reporting among far-flung manufacturing enterprises. "We're now making the same product in two or three different countries, and it's critical that we get a handle on what it's costing us," says Derek Mumford, newly named vice president of information technologies.

Recent investments in manufacturing control systems such as IBM's Copics also support the goal of controlling costs on a worldwide basis, Mumford says.

6 Ford Motor Co.

Among the Big Three, Ford has experienced the biggest rebound. The company earned $337.9 million in the first quarter of this year — a major comeback after last year's $884 million loss.

But nobody at this $88 billion automaker is crowing about a recovery, least of all in the 5,000-member decentralized IS operation, where spending currently runs below 1.5% of revenue and advanced technology has been placed on the back burner.

Cnossen says IS remains in a period of relative "introspection," trying to pinpoint those areas where its strengths can be aligned with corporate goals.

Most recently, IS has turned its attention to the plant floor, developing a suite of applications that allows production people to monitor and control work in progress.

7 Deere & Co.

By the time the recession hit Deere's agricultural and construction equipment businesses full force, IS was already fortified against the impact. Major investments in manufacturing resource planning, engineering and commercial systems over a 10-year period had improved efficiency. And Deere had recently wrapped up a worldwide networking project to integrate its mainframe and engineering workstations via Ethernet. "Now all of our plants have access to the same data," says R. D. Sonnenburg, director of computer IS.

Thus, Deere, which forecasts $202 million in IS spending this year, felt comfortable last February in turning down a proposal to outsource its data processing and worldwide communications to IBM.

"We've done a lot of competitive benchmarking," Sonnenburg says, "and we believe we are doing it cheaper."

DEFINING REALITIES

BUDGETS
Roughly half of these companies experienced a decrease in IS budgets last year. This trend is expected to be repeated in the coming year.

PRESSURES
IS departments in these industries are being asked to trim their own costs and supply systems that will reduce operating time and costs to market.

ORGANIZATIONAL CHANGES
Three quarters of these companies plan to merge or consolidate their operations by 1993. About half of the companies already have centralized operations. The remaining companies have both centralized and decentralized operations.

PLATFORM CHANGES
Well over three quarters of these companies say they plan to install proprietary systems within the next year.

8 Paccar, Inc.

At Paccar, the recession drove home the need to diversify. More than 80% of the corporation's business hinges on diesel truck sales, which tend to be cyclical.

IS general manager Bruce Carlson says his 360-member department is doing its part to further the company's diversification efforts, which have brought it into new areas such as after-market truck parts retailing, financial and leasing services.

Carlson says the department's $10 million in capital spending on software focuses largely on automation of the retail operation. Paccar has invested in EDI to improve order processing in both the retail and the mainstream truck businesses, and investments are being made in retail point-of-sale systems and electronic catalogs. Efforts are also under way in the computer-aided design, manufacturing and engineering areas.

9 Trinity Industries, Inc.

What's the good news about being the manufacturer of a product that has had soft sales for two years? Well, if you make a really big-ticket item such as railcars and orders have been off for that long, about the best you can hope for is a unique selling advantage so that you can capture a healthy share of whatever business there is. That's what Trinity Industries has managed to achieve. With some help from IS, the company has made itself into the market's lowest cost producer, with 50% of the industry's productive capacity.

Analysts expect demand to begin rebounding in the coming months as older rail cars are scrapped at accelerating rates — but better times ahead are not likely to cause the IS group to start spending wildly on new systems. This department has long hewed to a "conservative" systems philosophy that emphasizes financial discipline over leading-edge technology. There is probably a lot more mileage in those IBM Application System/400s.

10 Ingersoll-Rand Co.

After two lean years, this $3.6 billion maker of ball bearings, air compressors and other heavy equipment is cutting back on just about everything, including its 600-member IS group. George Tabback, director of corporate IS, says spending, which equaled 1.7% of revenue last year, is expected to fall as a percentage of the top line.

But Tabback still has ambitious projects on his plate, such as installing virtual networks to support Ingersoll-Rand's European expansion and implementing Pansophic's BPCS to help integrate manufacturing, distribution and financial functions.

Tabback says moving from the mainframe to the AS/400 and more packaged software could bring a big savings. In the UK, he says, 50 people supporting a mainframe have been replaced by 24 people supporting three AS/400s. ■

Mahler is a free-lance writer based in Jackson Heights, N.Y.

Breaking the mold

Companies concentrate on strengthening the customer link

BY EMILY LEINFUES

Manufacturers in the U.S. can't afford to be complacent: Worldwide recession is causing many customers to sit on their hands, and fierce competition has made raising quality an imperative and raising prices a near impossibility.

In many cases, small, incremental changes just aren't enough to move buyers or hold off the competition. Whole processes have to be reworked to gain new efficiencies. The supply chain has to be shortened and streamlined. Inventories have to be lowered, rework reduced and costs brought under control. Basically, the whole production structure must be reshaped. All of this requires aggressive and innovative use of information systems.

This will not be an easy job because U.S. manufacturing's worst enemy is often its own internal rigidity, according to Martin Ressinger, an analyst at Duff & Phelps, Inc. in Chicago. "Internal struggles based on old lines of power keep these companies from making obvious structural and cooperative changes," Ressinger says.

At leading-edge manufacturing companies where changes are being made, IS organizations are providing not only technology expertise but also assistance with process reform.

The *Premier 100* companies are also asking their IS organizations for the means to forge strategic partnerships with key customers. At Cone Mills Corp., for example, IS works hand-in-hand with the retail apparel industry to develop standards for quick-response, real-time linkage.

Customer satisfaction has become almost a religion at all of these companies. Providing customers with links into their systems is a priority at most of the Top 10 manufacturing firms because it allows a faster, easier response to customer needs and stengthens the ties that bind them.

Profitability now depends heavily on operating margins. For that reason, much attention is being paid to linking operations with business systems to provide a consistent set of numbers for everything from marketing analysis to automated inventory control. A case in point is Eastman Kodak Co., which has made integration its No. 1 concern.

Now, management is demanding cost accountability and maximum investment effectiveness. IS is responding to this trend by benchmarking best practices within the industry and focusing on improving quality. Cost control measures include eliminating non-value-added expenses.

Globalization is also an area of concern for IS groups in manufacturing. For example, industry leader Kimberly-Clark Corp. is spending $5 million to $7 million to redesign its telecommunications infrastructure to enhance point-to-point communications among customers, manufacturing and distribution sites.

INDUSTRY LEADERS

1. **D. James Dull**
   V.P., MIS
   Kimberly-Clark Corp.
2. **Harvey R. Shrodnick**
   V.P., IS
   Corning, Inc.
3. **Carl A. Kehrmeyer**
   V.P., Administration
   3M Co.
4. **H. William Howard**
   CIO
   Inland Steel Industries, Inc.
5. **Paul Vetter**
   Director, IS
   Cone Mills Corp.
6. **James A. Stutts**
   V.P. (Fieldcrest Cannon)
   Amoskeag Co.
7. **Candy Obourn**
   Director, IS
   Eastman Kodak Co.
8. **Bernie Campbell**
   V.P., IS
   Sonoco Products Co.
9. **A. L. Hyland**
   Director, Worldwide Systems
   Polaroid Corp.
10. **Walter H. Bargeron**
    V.P.
    Bethlehem Steel Corp.

1 Kimberly-Clark Corp.

Faced with maturing U.S. markets, fierce challenges in its major product lines and growing European competition, Kimberly-Clark is using technology to gain an edge. Key objectives include reducing order cycle time, improving customer service and generating customer-specific data for targeted marketing and merchandising. Working closely with Chief Executive Officer Wayne Sanders,

KIMBERLY-CLARK'S SANDERS *uses IS to cut order cycle time, improve customer service, guide marketing efforts*

former Chief Information Officer John T. Kohler used IS to speed electronic ordering across the board. His initiatives punched up domestic order processing and inventory control.

Kohler left the Neenah, Wis.-based paper and fiber products innovator in July to start a consultancy.

Next year, under the direction of new CIO D. James Dull, there will be a major emphasis on communications. The redesign of the firm's telecommunications infrastructure reflects the global nature of its business.

2 Corning, Inc.

Harvey Shrednick, Corning's vice president of IS, is charged with making quality improvement at the diversified manufacturer a reality. The company is banking on total quality management as its first and most powerful weapon against the competition. The Corning, N.Y.-based company, makes aggressive use of technology to track and analyze its quality programs.

Another initiative is revamping internal systems to boost office productivity and team effectiveness.

3 3M Co.

The IS strategy of 3M Co., a diverse global manufacturer, centers on the power of the personal computer at home, the economics of centralization abroad and electronic data interchange (EDI) worldwide. This year the St. Paul, Minn.-based office equipment and supplies company pursued distributed computing with a vengeance, configuring PCs and servers to connect directly to mainframes and cutting out the midrange processor.

This shift gives more capability to end users and brings computer power closer to the action. Improvements in telecommunications in Europe and the European Economic Community movement spurred 3M to plan consolidation of its 18 computer centers into five during the next few years.

CHALLENGES

- Process improvement
- Order management applications
- Retailing application development

KEY TECHNOLOGIES

NOW
- EDI
- On-line customer service
- Product scheduling

NEXT FIVE YEARS
- EDI
- CIM

4 Inland Steel Industries, Inc.

Competition from overseas manufacturers and domestic mini-mills has forced Inland Steel in East Chicago, Ind., to tighten its belt. For IS, this means emphasizing improved use of existing technology. Recently, IS staffers took a look at how departments actually used reports, eliminating some and tailoring the useful

PHOTOGRAPHY BY REID HORN

ones to the particular requirements of each set of users.

Inland Steel is also developing a long-term architecture based on smaller and more open systems, operating in a client/server mode. This puts more power in users' hands.

5 Cone Mills Corp.

Cone Mills, based in Greensboro, S.C., is on the verge of a public stock offering and in the middle of a market expansion. Because the textile supplier to the retail apparel industry is growing faster internationally than domestically, it is looking at videoteleconferencing techniques and high-speed networks that will connect it more effectively with Europe.

During the past year, Paul Vetter, director of information services, initiated a drive to move all key internal systems to real-time through re-engineering and the use of high-speed networks.

Heavily committed to EDI, the textile and apparel industries are working together to develop standards for nomenclature at a technical level.

6 Amoskeag Co.

Boston-based Amoskeag's major IS investment lies in its largest holding, Fieldcrest Cannon, Inc., the country's sixth largest textile manufacturer. Other holdings include real estate and a Maine railway, Bangor and Aroostook Railroad, which services paper companies.

Fieldcrest claims a 50% share of the U.S. towel market and 20% of the sheet market. The company's IS initiatives have included helping to incorporate a series of rapid expansions and acquisitions over the past decade, as well as embarking on major plant modernization programs.

Buffeted by the recession and overseas competition, Fieldcrest is trying to reduce debt and cut operating expenses, laying off 1,100 workers last year.

In 1988, the company formed three divisions with separate corporate managements and sales forces for faster response to customer needs, but they continued to share manufacturing facilities. Towel-

DEFINING REALITIES

BUDGETS
Less than half of these companies expect their budgets to change by 5% or more in 1993.

PRESSURES
Producing a continuous stream of new products. Rapid technological growth.

ORGANIZATIONAL CHANGES
Most companies have a mix of both centralized and decentralized operations.

PLATFORM CHANGES
A large majority of companies plan to install nonproprietary systems in the next year.
Less than half plan to downsize from larger platforms to smaller ones.

making plants are being upgraded in a five-year, $250 million modernization project to increase efficiency. Analysts say that if Fieldcrest can slim down its debt and expenses, it will be well-positioned to be strong when the recession lifts, and efficient IS operations will be a key component of that strength.

7 Eastman Kodak Co.

New IS chief Candy Obourn's title says it all. As vice president of IS and business processes, Obourn has set out — with the help of Kodak's outsourcing partner, IBM's Integrated Systems Solutions Corp. — to transition the Rochester, N.Y.-based company's core businesses to client/server computing and re-engineer business processes along the way.

After two successful pilots, Kodak recently began full-scale implementation of a software system that integrates order processing with manufacturing, financial distribution and operations.

The main business objectives include reducing cycle time and errors in manufacturing and order processing and providing a more comprehesive view of current financial and operations conditions for decision-making and planning. Re-engineering the core businesses will take five to 10 years.

The company has also reduced its infrastructure cost and number of IS workers by about 10% during the past year through early retirement.

8 Sonoco Products Co.

As Sonoco shifts from a large, domestic paper packaging manufacturer to a global supplier, IS management at the Hartsville, S.C., firm is devising a coosistent IS architecture that will not only cross cultures but also permit the merging of administrative, product, marketing and logistical data from many locations. The systems environment, which will have to cope with more product variety and shorter product lifetimes, will likely be based on a mixture of Digital Equipment Corp. VAXs and IBM Application System/400s and PCs.

Bernie Campbell, vice president of corporate information services, considers those changes just a starting point. "Once you have core systems, then you can look at creative ways of using the information."

9 Polaroid Corp.

Integration is the operative word at Polaroid. The photographics products company, based in Waltham, Mass., is beset by intense global and domestic competition. IS' response is to increase decision support capability while reducing overall costs.

Polaroid's director of worldwide systems, A. L. Hyland, is moving applications to common platforms and operating systems. Key technologies include relational database management systems, such as IBM's DB2 and The Ask Cos.' Ingres, local-area networks and Unix.

10 Bethlehem Steel Corp.

In an industry in which none of the major manufacturers are running at more than 75% to 85% capacity, you have to be efficient. Bethlehem Steel in Bethlehem, Pa., is determined to be efficient. It is using IS to manage inventory levels and production for maximum profitability.

This charge is led on four fronts: better data management, enhanced connectivity, more "user-friendly" software and better software integration. ■

Leinfuss is a free-lance writer based in Sarasota, Fla.

Petroleum and Chemicals

Down to fighting weight

Less is more as leading users battle recession

▶ BY CHERYL GERBERG

INDUSTRY LEADERS

1. **Charles Bowerman**
   Executive V.P. and CIO
   Phillips Petroleum Co.
2. **Donald S. Pirkle**
   V.P., Corporate IS
   The Dow Chemical Co.
3. **Dan Irwin**
   V.P., Technology, Manufacturing, IS
   FMC Corp.
4. **Paul R. Jones III**
   Director, Corporate IS
   Unocal Corp.
5. **Georgia-Anne Bebo**
   Manager, Corporate Information Resources
   Union Texas Petroleum Holdings, Inc.
6. **Leonard A. Cohn**
   V.P., Corporate MIS
   Monsanto Co.
7. **Gaige R. Paulsen**
   CIO
   Ashland Oil, Inc.
8. **David A. Stitely**
   CIO
   Rohm and Haas Co.
9. **Ken Rohan**
   Vice President, IS
   NERCO, Inc.
10. **Peter W. C. Mather**
    V.P., IS
    Air Products and Chemicals, Inc.

KEY TECHNOLOGIES

NOW
- Seismic processing
- LAN operations

NEXT FIVE YEARS
- Client/server systems
- LANs
- RAID storage

PHILLIPS PETROLEUM'S *IS manager Jim Gottardi moves IS closer to users*

Rightsizing, recession and recovery are the main challenges to the petroleum and chemicals industries. Information systems teams face a daunting task: adapt technology to make their firms more cost-effective in the face of dismal business conditions. Although a gradual economic recovery is expected to help pull the chemicals industry out of the doldrums, petroleum companies have been pummeled by falling demand, high exploration costs and low prices, and they may not see a turnaround for some time.

Both industries see the strategic advantages of implementing information technologies. However, the petroleum industry cut IS budgets by an average of 2.2% in 1992, and chemical companies increased theirs by a scant 0.8%, according to a recent survey by CSC Index, Inc. in Cambridge, Mass.

IS efforts to make order fulfillment, manufacturing and distribution systems more effective are part of an overall plan in many companies to create a system that manages the flow of materials from the time an order is placed to when it is shipped to achieve 100% on-time delivery to customers. Refineries are also looking at ways to integrate manufacturing functions.

Where possible, companies are moving applications from mainframes to lower cost minicomputer- and personal computer-based local-area network platforms and are giving control of the systems to individual business units. This trend is allowing business units to explore decentralized decision-making. The decentralization trend is key for the No. 1 company in this category, Phillips Petroleum Co. The firm's mandate is to

PHOTOGRAPHY BY ALAN LEVENSON

The Premier 100

DEFINING REALITIES

BUDGETS
Cutbacks have been common. In many instances, budget reductions exceeded 10%.

PRESSURES
Companies will make greater use of systems integrators to control costs. Fifty-six percent of the top companies surveyed said they would increase this service, more than any other industry category.

ORGANIZATIONAL CHANGES
Data center consolidation is rife in this industry. In fact, this industry had the highest percentage of consolidations last year.

PLATFORM CHANGES
Many companies are planning on downsizing, citing system effectiveness as a primary concern. More than half are sticking with propietary systems.

CHALLENGES

- Integration of CASE technology
- Managing more work with same resources

decrease its budget and distribute part of its programming staff from a centralized mainframe environment to decentralized business unit teams. The move was designed to allow users greater control and access to system resources.

1 Phillips Petroleum Co.

Celebrating its 75th anniversary this year, Phillips Petroleum is the ninth-largest integrated petroleum company in the U.S. Hard hit by the recession and the fall of oil and gas prices, the Bartlesville, Okla., company has trimmed its 22,700-person work force by 1,200 and has reduced its overall capital budget by about 16% from 1991. IS has not been spared: Its budget took a 20% hit, dropping to $183 million.

Faced with these challenges, the IS organization is moving technology closer to users. Some of the IS work load and programming staff will be moved from IBM 3090 mainframes to IBM RISC System/6000s and Sun Microsystems, Inc. SPARCstations. The move, currently for software development and scientific applications, will save mainframe cycles and help the company defer future mainframe upgrades.

Because programmers won't have to wait for the mainframe and can use workstation-based development tools, Phillips expects the move to improve programmer productivity.

2 The Dow Chemical Co.

As a commodity chemical company, Dow in Midland, Mich., has been hit particularly hard by the recession. Cost cutting, therefore, is the order of the day in IS.

During the past five years, Dow has been working to make IS more efficient by integrating systems across the entire company. For example, it has linked all applications relating to the order life cycle — from the original order entry to production to distribution — into a companywide financial management system.

The system lets Dow provide real-time information to customers about the status of a product they have ordered or are thinking about ordering, no matter where it is in the process.

3 FMC Corp.

Mixing technology savvy with a business diversification strategy, Chicago-based FMC was one of the few chemical companies to post gains during the past year. Net income rose 18% between the first quarters of 1991 and 1992.

Nonetheless, FMC is continually looking at ways to reduce costs. The company has trimmed the number of IS workers by about 10% during the past few years by automating and consolidating operations.

To save utility costs and improve data accessibility, FMC is implementing a private telecommunications network in Europe, which is an extension of its U.S.-based wide-area network.

4 Unocal Corp.

Returning to its core businesses has caused Los Angeles-based Unocal's IS organization to downsize its systems to save $9 million this year and make applications more accessible.

A sell-off of divisions has prompted Unocal to consolidate three data centers into one by the spring of next year. Between 1990 and 1992, IS staff will be cut 20%, with many of the remaining workers organized into cross-functional teams. Such a team may include people on the help desk, who handle a variety of areas such as network management, mainframe operations and PCs.

To help geophysicists obtain better access to seismic information for exploration, Unocal is migrating the applications on its IBM Enterprise System/9000 Model 820 to a Convex Computer Corp. 3840 minicomputer connected to 100 Sun SPARCstations.

Other initiatives include consolidating the management of the company's WANs and using multimedia to develop just-in-time training systems to provide workers with timely, relevant information.

5 Union Texas Petroleum Holdings, Inc.

Union Texas Petroleum's IS organization has maintained a high level of effective service despite an earthshaking downsizing effort that has seen the company sell off three of its major U.S. operations to concentrate on international exploration.

The work force at the Houston-based company has been cut by a drastic 65%. Not surprisingly, IS saw its budget slashed from $12 million to $6 million between 1991 and 1992, with another $2 million in cuts expected next year. The IS staff has been cut by 60%.

The secret to maintaining strong IS services in this environment, says corporate IS manager George Anna Bobo, is a combination of outsourcing and placing more services under the control of users.

For example, payroll functions have been outsourced, and IS plans to replace its IBM 3090 with a Digital Equipment Corp. VAX 4000/500 early next year.

The company is also migrating some systems, such as human resources and international accounting, to PC LANs. Data access for ad hoc reporting has been

shifted from the IS group to individual departments, which cuts the need for IS support in half.

6 Monsanto Co.

Unlike many of its *Premier 100* peers, Monsanto's IS organization has the luxury of doing more with more. The chemical group at the St. Louis-based company saw its operating income increase 5% in the first quarter, which allowed the IS budget to swell by 10% this year.

Monsanto's technology investments are aimed at improving such global decisions as determining which plant is best for manufacturing a particular product or where in the world to obtain the most favorable interest rates.

Monsanto is also devising a list of corporatewide standards of preferred vendors, software packages and operating systems. Implementing these standards will help Monsanto get better pricing through volume purchases and minimize training costs.

7 Ashland Oil, Inc.

After selling a number of subsidiaries that didn't fit its mix, Ashland Oil in Russell, Ky., is beefing up its areas of strength — chemicals, Valvoline automotive products and SuperAmerica convenience store divisions. During the past year, Ashland acquired Unocal's chemical business, and Ashland's Scurlock crude oil division acquired Permian Corp.

Ashland's IS organization is charged with quickly integrating the new acquisitions into the fold. A major task of this effort is to incorporate them into the shared corporate data center that provides telecommunications and mainframe resources for all divisions.

In addition to this strong central approach, the divisions each pursue respective rightsizing efforts, moving as much software development as possible off the mainframe to a PC platform. Such rightsizing may involve moving to PC LANs as well or to IBM Application System/400s connected to the central mainframe for client/server computing.

CHEMICAL AND PETROLEUM FIRMS *focus on improving efficiency of production*

8 Rohm and Haas Co.

Philadelphia-based Rohm and Haas has responded to the lows in the chemical industry by getting down to basics: customer service.

Although the company's diversified specialty chemicals business — plastics, agricultural chemicals, polymers and resins — produced earnings of $59 million for the first quarter of 1992, up from $41 million for the same quarter last year, the company wants to do better by providing customers with 100% on-time delivery.

This is the goal of a $10-million materials management system that will integrate order processing, materials management and manufacturing for the company on a worldwide basis. The materials management program, STSC, Inc.'s Logistics Plus, will help Rohm and Haas forecast demand to determine the materials needed to meet production schedules.

9 NERCO, Inc.

NERCO suffered a first-quarter loss of $178 million because of an 18% nosedive of natural gas prices in February (the lowest level in 12 years) and wants to cut costs wherever possible.

That includes plans to replumb and consolidate its computer operations. The idea is to invest now to lower per-unit production costs for a leaner and meaner future. The company's new architecture is based on an open systems environment, with DOS and Microsoft Corp. Windows-based PCs linked via Novell, Inc. LANs, which are tied to Unix-based Sequent Computer Systems, Inc. S2000s and Sun SPARCstations and servers.

On this platform, NERCO is consolidating the accounting applications for its three divisions — oil, gas and minerals — under Oracle Corp.'s financial software running on a server.

10 Air Products and Chemicals, Inc.

Air Products and Chemicals' emphasis on specialty chemicals, which suffered less during the recession, combined with the company's gas contracts, which are longer term "take or pay" agreements unaffected by quarterly demand cycles, helped the company stay competitive and post a modest 2% first-quarter profit.

The Allentown, Pa., firm's widely respected IS organization is redistributing many of its centralized resources to three main business units. ■

Goldberg is a free-lance writer based in San Francisco.

PHOTOGRAPHY BY BOB THOMASON/TONY STONE WORLDWIDE

US WEST Communications

Network Operations Center
Always running
Always open
Always reliable
Sun Service and Support.

©1992 Sun Microsystems, Inc Sun, Sun Microsystems and the Sun logo are trademarks or registered trademarks of Sun Microsystems, Inc All SPARC trademarks, including the SCD Compliant logo, are trademarks or registered trademarks of SPARC International, Inc SPARCstation is licensed exclusively to Sun Microsystems, Inc Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc All other products or service names mentioned herein are trademarks or registered trademarks of their respective owners.

The technicians of US WEST's Network Operations Center of Colorado know the price of a switch failure: Police, fire, rescue, hospital – all would be out of communication.

The challenge: To guard, maintain and surveil the switches which give the reassuriog dial tone to the entire 14-state US WEST territory.

Their partner: Sun Microsystems® and Sun™ Worldwide Customer Support, providing 24-hour hardware, software, and network protection.

Their common creation: A powerful system of Sun SPARCservers™ linked with Suo SPARCstations™ that let each techoician monitor several switches right from the desktop.

The installation, configuration, and customization of the front-end ioterface? All handled by Sun. And all right on schedule.

Coming sooo: Huodreds more Sun SPARCstations and Sun SPARCservers. Io Network Operations Centers io 14 western states for 25 million US WEST customers.

With a dial tone for every one. To learn more, call 1-800-426-5321, ext. 500.

Sun

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc. Business

Pharmaceuticals and Food

Spending for the future

Companies take advantage of a buyers' market

▸ BY DANIEL LYONS

Recession or no, pharmaceuticals and food companies have continued to invest heavily in information technology in 1992. On average, drug companies will spend 7.3% more on technology this year than last — more than double the 3.5% average gain for all industries, according to CSC Index, Inc.

By increasing spending during the recession, drug companies have been buying technology and consulting services at lower costs, positioning themselves for a competitive advantage when the recession ends, says Michael Hawotte, a director at A. T. Kearney, Inc.

Drug companies are hot for technologies such as videoconferencing to save on travel and imaging to speed document processing time. There's one overriding goal behind almost all investments, however, and that is this: Compress the product cycle, says Peter Kirn, managing partner of the pharmaceuticals industry practice at Andersen Consulting in Chicago. "On average, it takes 12 years and $250 million to bring a drug to market," he says.

On the manufacturing side, pharmaceuticals companies are looking to improve yields by raising quality or volume — or both. "I had a client tell me once that if he could raise the yield on a product by 0.5% it was worth $10 million a year to him," Hawotte says. The ultimate, but still hypothetical, manufacturing environment is a "lights-out" operation.

As for marketing, pharmaceuticals companies are launching more joint ventures with one another, requiring better coordination of sales force automation programs and customer service streamlining.

Increased efficiency is also the name of the game in the food industry, chiefly on the marketing and distribution side of the business.

By developing tight electronic data interchange (EDI) links with grocery stores, for example, food manufacturers can provide just-in-time shipments to outlets, thereby reducing inventory and shipping costs. Still, storefronts have been slow to adopt EDI technology.

That's mostly because distributors and resellers still see EDI as a one-way street: It helps manufacturers, but the benefits to consumers and retailers have not been shown. "Technology can monitor what is actually happening in a store vs. what we think is happening. Down the road, it may even tell us what consumers want," says Glenn Terbeek, managing partner of the food and packaged goods industry program at Andersen Consulting.

1 Merck & Co.

Perhaps the biggest computer-related event at Merck in the past 12 months was the Nov. 1, 1991, appointment of Charles Popper, a former partner at Deloitte & Touche, to run Merck's worldwide computer operation.

The challenge, as Popper sees it, is to find ways to deliver products more efficiently. "We're facing fundamental changes in the marketplace in

INDUSTRY LEADERS

1. **Charles Popper**
   V.P., Computer Resources
   Merck & Co.
2. **Robert Lyons**
   V.P., Corporate IS
   Schering-Plough Corp.
3. **Roland Cyr**
   V.P., Information Technology
   Becton, Dickinson & Co.
4. **Vincent H. Swoyer**
   V.P., Corporate Systems
   Sara Lee Corp.
5. **Lyle Y. Bosecker**
   Director, Corporate IS
   International Multifoods Corp.
6. **Allan B. Deering**
   VP, MIS
   Pepsico, Inc.
7. **Alex Gibbons**
   Corporate Director, IS
   Bristol-Myers Squibb Co.
8. **Jack R. Langman**
   V.P., Information Resource Management
   Upjohn Co.
9. **Kenneth Farmer**
   V.P., MIS and Administration
   Abbott Laboratories
10. **Ron Morris**
    CIO
    Johnson & Johnson

CHALLENGES

- Networking
- Decentralization
- Quality improvement

KEY TECHNOLOGIES

NOW
- EDI
- Telecommunications
- Shipment and tracking systems

NEXT FIVE YEARS
- Client/server systems
- RAID storage
- EDI
- Groupware

What would you like to know about Sun?

- ☐ Why should I consider Sun for general business computing?
- ☐ How have Sun solutions helped companies like mine?
- ☐ What is Sun's information systems strategy?
- ☐ How can Sun solutions help me redistribute the data processing workload throughout my business enterprise?
- ☐ How can Sun help me migrate and deploy key database applications from a proprietary to an open systems environment?
- ☐ What business applications can Sun deliver to me?
- ☐ What products does Sun offer in addition to workstations?
- ☐ What customer support solutions does Sun offer?

What industry are you in?

☐ Finance/Banking/Accounting	☐ Pharmaceutical	☐ Manufacturing
☐ Transportation/Utilities	☐ Aerospace	☐ Construction
☐ Insurance	☐ Automotive	☐ Engineering
☐ Telecommunications	☐ Electronics	☐ Oil/Gas
☐ Health/Medical services	☐ Retail	☐ Other:_____

Just fill out the card and send it to us.

Name _____

Company _____

Title _____

Address _____ City _____

State _____ Zip _____ Country _____

Telephone _____ Fax _____

Sun

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc. Business

PLEASE FOLD BACK ALONG THIS LINE. DO NOT TAPE OR STAPLE

NO POSTAGE
NECESSARY
IF MAILED
IN THE UNITED
STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 11313 BRIDGETON, MO

POSTAGE WILL BE PAID BY ADDRESSEE

SUN MICROSYSTEMS, INC.
PO BOX 4491
BRIDGETON, MO 63044-9822

CHARLES POPPER: *'We're facing fundamental changes in the marketplace'*

terms of price pressure, demands for better service and finding ways to deliver our products more efficiently," he says.

Merck, an $8.6 billion pharmaceuticals giant, placed No. 1 in last year's *Premier 100*, too. The company will spend $230 million on information technology this year. Major outlays include the recent acquisition of a Cray Research, Inc. YMP supercomputer to replace an IBM 3090 for computational chemistry.

The supercomputer will add "substantially more capacity to use molecular modeling techniques in support of research," Popper says.

Merck is redesigning its clinical research program and re-engineering its worldwide networks to reduce the time it takes to bring products to market. Merck continues to automate its manufacturing plants to improve yields. "We're moving toward computer-integrated manufacturing. We have automation in a number of plants," Popper says, "but it's a multiyear effort to get to a more complete level."

2 Schering-Plough Corp.

Schering-Plough jumped from eighth place in last year's *Premier 100* to second place this year. The Madison, N.J., company has increased its focus on developing applications for sales and marketing, including new local-area network-based systems and sales force automation programs that should improve its relations with customers.

In an effort to contain costs, the $3.6 billion company has not increased its IS staff this year. Schering-Plough's IS budget will be $67 million this year, a gain of about 10%. The company makes pharmaceutical and consumer health care products.

3 Becton, Dickinson & Co.

Globalization is the mobilizing trend at Becton, Dickinson this year. The $2.2 billion company is rolling out a set of common applications — such as order management, sales, financial reporting and accounting — on a worldwide basis, using frame-relay technology for data communication.

The idea is to improve the consistency of data across the organization. "Our key objective is to be able to communicate, consolidate and provide easy access to information on a worldwide basis," says Roland Cyr, vice president of information technology.

The Franklin Lakes, N.J., company is also expanding its global communications network, installing videoconferencing facilities at 13 sites, with plans to add five more. This is crucial technology because the company is flattening its structure and building teams to manage each of its 11 major product lines. Team members may be from sales, marketing and research staffs in centers all over the world.

Later this year, the company will roll out a worldwide human resources database. The IS budget is $58 million, up 16% from $50 million last year.

4 Sara Lee Corp.

Less is more, according to the IS recipe at Sara Lee, which is migrating from mainframes to microcomputers.

"Our intent is to exploit the capability of the micro," says Vincent Swoyer, vice president of corporate systems. "We're already using it in mission-critical applications."

Only one mainframe application survives in the corporate offices from five years ago. Everything else — all tax work and financial consolidation, for example — is done on personal computers.

Manufacturing work has already shifted from mainframes to Digital Equipment Corp. and IBM minicomputers; Swoyer says that eventually those applications will migrate to microcomputers again.

The Chicago-based company has more than 3,000 IS people worldwide. Many are being retrained in

PHOTOGRAPHY BY DAVID ZICKL

client/server technology.

The company's IS budget this year will be $138 million, of which 45% will be spent on the IS department's 1,400 staff members. About 4.5% of the budget will go toward training. The company has 108,000 employees and 30,000 PCs.

5 International Multifoods Corp.

Based in Minneapolis, International Multifoods is a $2.2 billion food processing company. This year's IS budget is $11 million, of which $4 million will be spent on the company's 140 IS staff members, and $100,000 will go toward training users.

International Multifoods has 1,500 PCs and $4 million worth of major processors.

6 Pepsico, Inc.

Ray Charles isn't the only one singing the praises of Pepsi. Ranked 10th in its industry in the *Premier 100* last year, Pepsico, based in Purchase, N.Y., leapt to the No. 6 spot in 1992. Uh-huh.

To improve productivity, Pepsico's top brass has emphasized "empowering" its employees this year. And though the company is pushing more responsibility out into the field, it is also pushing technology.

In March, the $5.9 billion company made a substantial minority investment in a Denver company, Carts of Colorado, Inc., which has developed a "smart" vending cart that can relay sales information via telecommunications and computing equipment to a central location.

Pepsico will deploy the carts at schools, ballparks and shopping malls, stocked with food from its Taco Bell restaurant chain. The company is also outfitting its Canadian truck drivers with handheld computers to relay sales data. The program began in the U.S. several years ago.

7 Bristol-Myers Squibb Co.

The beat goes on at Bristol-Myers Squibb, thanks in part to Pravachol, a drug that fights heart disease. Pravachol, which won FDA approval last fall, is expected to be a blockbuster that will buoy profits at Bristol-Myers Squibb for the next few years.

In response to pressure from customers, Bristol-Myers Squibb this year said it would cut the prices it charges federal health programs by at least 12.5%. The company will try to make up the difference by raising consumer prices and increasing volume sales to federal agencies. Efficiency gains through technology will play a vital role in this plan, says Alex Gibbons, corporate director of information services.

The total IS budget in 1992 is $209 million. With sales of $11.3 billion, the New York-based firm is, after Merck, the second largest pharmaceuticals firm in the U.S.

DEFINING REALITIES

BUDGETS
Half of the IS departments in this group had more money to spend last year, and half expect an increase next year.

PRESSURES
More than two-thirds of the leading companies reported they will consider outsourcing all or part of their IS operations in the coming year.

ORGANIZATIONAL CHANGES
More than half of these companies plan to merge or consolidate a data center in the coming year.

PLATFORM CHANGES
Changes have been minimal. This industry remains a bastion of large systems.

8 Upjohn Co.

Upjohn, based in Kalamazoo, Mich., is trying an experimental marriage of marketing and IS. Last year, the company moved Ralph Feldt, an executive in worldwide marketing, into IS, with two goals: to teach IS staff members ways to market themselves internally and to help business managers learn to use IS services.

The move comes at a critical juncture for Upjohn. The $3.4 billion pharmaceuticals giant faces patent expirations on several key drugs, as well as problems with Halcion, its sleep medication.

Some say the drug has dangerous side effects; Upjohn insists that Halcion is safe. So far, the FDA agrees with Upjohn.

9 Abbott Laboratories

In June, six months after winning FDA approval for temafloxacin, a key new antibiotic, Abbott withdrew the product because of adverse reactions among patients.

But the Abbott Park, Ill., pharmaceuticals leader probably won't even break stride. The company posted record sales of $6.9 billion in 1991 and is considered strong because of the diversity of its product lineup, which includes Selsun Blue shampoo and Similac infant formula.

Ranked among the Top 10 in its industry for the past four years, Abbott's IS strategy includes investments in an automated purchasing network and the sale of its own health care planning and marketing software.

10 Johnson & Johnson

Decentralization is no mere technological Band-Aid at Johnson & Johnson. It is at the heart of the company's culture. As new products are created, a new operating unit is dedicated to producing and marketing them. The role of IS in this environment is to support the efforts of the business units and keep centralized functions to a minimum.

The pharmaceuticals and consumer products company, based in New Brunswick, N.J., posted sales of $12.4 billion in 1991. Approximately $231 million will go to IS this year. A major initiative is the installation of a worldwide videoconferencing network.

The network, based on Integrated Services Digital Network, will eventually link 36 locations. It will reduce travel time and expenses as well as keep information moving more smoothly throughout the organization. It will also help the company communicate better with its customers and suppliers, says Ronald Morris, vice president of information technology. ■

Lyons is an Ann Arbor, Mich.-based freelance writer.

Retailing and Wholesaling

Luring consumers with conspicuous efficiency

Limited but well-targeted spending pays off

▶ BY LUCIE JUNEAU

BOB MARTIN *heads IS at Wal-Mart, a leader in inventory management*

The spend-what-you-earn Eighties have turned into the frugal Nineties, and retailers, as well as their suppliers, are feeling the chill. Even supermarkets are hurting. "You normally think of trading down as buying hamburger instead of sirloin, but this time we have seen the consumer go straight from sirloin to pasta," says Joseph C. Ronning, a retail analyst at Brown Brothers Harriman & Co., a New York investment research firm.

To survive, retailers are clinging to the tried and true: great service and lower prices. To offer the lower prices consumers demand, retailers must rein in expenses. That's where technology comes in. Many retailers are implementing inventory management systems, which cut overhead costs and prevent loss of customers because of low stocks of high-demand items. Nordstrom, Inc., for example, is rolling out an item inventory system that includes the use of radio frequency universal product code (UPC) scanning devices and touch-screen personal computers to help merchandisers make smarter buying decisions and allow them to monitor the unexplained loss of goods.

Continued on page 40

KEY TECHNOLOGIES

NOW
- EDI
- On-line customer service
- Inventory management systems
- Data management tools

NEXT FIVE YEARS
- Wireless data networks
- Order and supply-chain applications
- Open systems

INDUSTRY LEADERS

1. **Bob L. Martin**
   Executive V.P. and CIO
   Wal-Mart Stores, Inc.
2. **C. A. Carlson**
   President, Sears Technology Services
   Sears, Roebuck and Co.
2. **Andrew McKenna**
   Senior V.P., IS
   The Home Depot, Inc.
4. **Vincent Hellar**
   V.P.
   FoxMeyer Corp.
5. **Malcolm Mitchie**
   V.P., IS
   Dillard Department Stores, Inc.
6. **David M. Carlson**
   Senior V.P., Corporate IS
   Kmart Corp.
7. **Denny Steele**
   Executive V.P.
   Bergen Brunswig Corp.
8. **C. Ray Rasbeson**
   V.P., IS
   Winn-Dixie Stores, Inc.
9. **Dennis Healey**
   V.P., MIS
   Toys R Us, Inc.
10. **Charles T. Mitchell**
    DP Manager
    Nordstrom, Inc.

PHOTOGRAPHY BY KENT HANSON

Of course,

your applications run on Sun.

Lotus 1-2-3	Tradelook	MSDFS	MARCH PLAN	AutoCAD	Wingz
Openlmage	TID	Tensile	Renderman	ARC/INFO	FIX Design
XSP	Wordperfect 5.0	Analog Design	GADYS	S-FIGES 2D	APT Workbench
ImageFlow	Sun LSTE	& Analysis	Stanza 2405	Fuzzy-C	FOCUS
ATW	IT3	System	DMS	AHVS.	CMS SAS
Interleaf 5	OBSERVE	Solbn Undo	SCADAGEN	STRAS III	FloSure Plus
EIDAS	Actor*x	Page Station	Gentleman	FrameMaker 2.0	CMS SURF
IES	3020	SHERLOCK	ASPEN PLUS	SITE	SAARC Software
Adobe	Comex Breeze	Prophesy	Gemini 5	MatVision	PICOSPOINTE
LOGISCOPE	Solbn Undo	SAS	Open Molecule	IDMS	AP*SQL
Quantum	Image Station	COSCOT	Gossip	FloTex	Procise/SPX
T2S	UNI FOSS	FS Partner for	MAGA	Tople	SAS System
X Word	PRO TRANSIT	UNIX	TamerTrak	LAMDARS	PICOSCEPT
ABAQUS	BASS	RealTime MPS	Image-Pro	Disk Manager	ViridiVere
BANNER	TOOS	XTrade	Visualization	HELIX I	SIMSOO
ElectroFlex 32	ELOS	OPTIMI POWER	Wordmark	SPSS Emulation	Sybase
PRAP	POLYGRAF	T.A.P.S.	VS-1200	SCRIARS	CA-Ruplan
Twin Sun, Inc.	UNIRAS	Standware	VICOM-VIII	Concept Express	INFORMIX-SQL
TRICS	PI-WAVE	Solotex	CAD-View	PRISMA	Empress
Quote Tracker	Tensorark	TRA SUPERS-3	VAPS	Vanguard	SAAS
TRADE	Looking Glass	Blindfol	GKTol	ARIES	Solotex Power
TroFax	CCC	Advertext	UNI Track	FIX Planning	Ingres
AutoPLAN	SIDUSA	Publisher	XVT	CHAMSRA	ACS
Tablelt	Maple	VTPER	SIMSIGHT	System	VERSAFLX
CADDS	SNAGRAPHICS	PrenoSorv	ALEX	Integrator	Oracle
Snowvision	Dynaflow	ExpressNSS 2	GlassPoem	SASAF	MATRIXX
Sapro	PSTRAN	SPSS	CDSSL	Software	CADKEY 4
Informix	GLOSS	Trader WS	GS	CMS CAN	CMS CAD3D
Rasonix 3000	SPICE FINANCE	Solotex	INFORMIX-NET	Digital Photo	Personal Designer
Unigraf	VSDA System	Finance	Prolog	VERSANT	PYRSCHANNEL
Business	Simulator	SSS Plus	AR*SQL	Cleverland	VersaCAD
Software	SYSTANT	Fr*SQL	SolidSection	N-3000	Teamwork/RT
BASE	Arts & Letters	FourGen	GNTOS C++	SASAS Software	ADAS
APEC SUPER-DUCT II	Composer	Accounting	SPSS	Data Workbench	Teamwork/SARA
	ARALYST	Cadre Tine	GENSTORE	C-MAN	CMS CUT
NYAC Drafting	WordBASIC	SolidCAD	Amplify Control	INFORMIX-4GL	N-3000 XPS
GPUS	Artisan	SAGES 2	IDMS	Teamwork/XS	Teamwork/SA
Oracle	PowerHouse	Portmaster	Fal/Text	VERSANT Star	IAS
ATA	Abaqs Virtuoso	LIBRALIBS	UNIFY 5.0	Z-Display	ACCELLICP
ObjectStore	InfVe	X Word +	RDBMS	SOMEASTAR	Plus
PSMS	Express	EDIT ACCESS	Sigmon	Oracle*Tool	Series 5000
TRAS	SERVER	AUTOMIN	Effec	SQL*Tool	GlobalView
Logitours	MathCAD	Synix	Turbocomp	UNIFY 2000	To-Solid

©1992 Sun Microsystems, Inc. Sun, Sun Microsystems, and the Sun logo are trademarks or registered trademarks of Sun Microsystems, Inc. All SPARC trademarks, including the SCD Compliant logo, are trademarks or registered trademarks of SPARC International, Inc. SPARCstation is licensed exclusively to Sun Microsystems, Inc. Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc. All other products or service names mentioned herein are trademarks or registered trademarks of their respective owners.

But we wouldn't leave it at that.

No matter what business application you need, you can run it on a Sun™ SPARCstation™ or a Sun SPARCserver.™

There's software for word processing, databases, graphics, spreadsheets, accounting and payroll, drafting and drawing. More than 4500 applications in all. Including favorites like Lotus 1-2-3,® dBASE IV,® and WordPerfect.®

But we wouldn't leave it at that. A Sun SPARCstation not only runs your favorite software, it can run them all at the same time, thanks to true multitasking. That means while you're busy writing a business letter, your SPARCstation can be calculating spreadsheets and searching databases in the background.

And while you're running applications on your SPARCstation there's something else working in the background: software development to introduce even more applications for Sun.

In fact, programmers prefer Sun as a development platform for its power and ease of use. Which means that should you wish to develop your own corporate applications, you will find a robust, tried-and-true developer tool kit.

Either way, more and more businesses are choosing to run their applications on Sun. Not only for what they can run on Sun, but for how they can run it.

Sun

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc. Business

Continued from page 37

Retailers are finding that improving the logistical side through technology is a way to ensure payoffs, says Tom Hennessy, a consultant at retail consulting firm Davidowitz & Associates, Inc. Wal-Mart Stores, Inc., No. 1 among this year's *Premier 100* retailers, has long been a leader in this area, making extensive use of electronic data interchange (EDI) to communicate with its vendors, which helps speed products through the pipeline.

Retailers also continue to invest in network infrastructures to enhance both in-house communications and the exchange of information with trading partners.

The Home Depot, Inc., for example, is designing a Transmission Control Protocol/Internet Protocol (TCP/IP) network to carry EDI transactions over its Scientific Atlanta satellite network. This will also support credit transactions and heavy transaction processing applications. And Toys R Us, Inc. is testing a new satellite network to link its U.S. stores in a first step toward multimedia, videoconferencing and other applications with high-bandwidth requirements.

RETAILERS FIND *electronic systems for inventory and check-out efficient, profitable*

1 Wal-Mart Stores, Inc.

Wal-Mart's information technology is second to none, competitors and analysts agree. And it's probably no coincidence that the $54 billion company, based in Bentonville, Ark., is also the nation's fastest growing and most profitable retailer.

Wal-Mart enjoys exceptionally low operating costs and passes the savings along to customers, typically underpricing competitors. Armed with automated quick-response systems, Wal-Mart can maintain remarkably low inventories: A Wal-Mart store devotes 10% of its square footage to inventory, compared with an industry average of 25%.

Last year, Wal-Mart moved to provide sales figures to suppliers directly, speeding the automated replenishment cycle.

2 Sears, Roebuck and Co.

Falling behind Wal-Mart and Kmart Corp. in the retail sweepstakes was a rude awakening for industry giant Sears. In 1991, Sears' retail revenue of $34 billion trailed Wal-Mart by $10 billion and Kmart by $1 billion.

Roused to attention, Sears has moved to make its retail division more competitive by cutting operating costs. Recent measures include adding 28,000 CompuAdd Corp. cash register terminals to 22,000 existing NCR Corp. point-of-sale terminals (to be upgraded with new software). This move will allow Sears to cut about 1,000 full-time nonsales positions and 5,900 part-time jobs at its 868 stores, reducing annual operating expenses by about $50 million.

CHALLENGES

- Moving more quickly to production
- User training

3 The Home Depot, Inc.

When money is tight, the do-it-yourself home improvement business is good. Business is particularly good at Home Depot, now the largest U.S. retailer in the category. Sales at the company's 180-plus stores were up 35% last year.

To handle the increased business and its ongoing expansion, Home Depot will increase mainframe capacity 50% this year, after doubling it only a year ago. All in-store systems are being replaced with Unix-based Hewlett-Packard Co. processors in the belief that a commitment to open systems will help keep its costs down while maintaining flexibility for growth.

Soon a new TCP/IP network will carry EDI transactions and other traffic via Home Depot's satellite. Home Depot is expanding its use of EDI to improve inventory replenishment, adding new vendors to the system daily.

4 FoxMeyer Corp.

The 1990s have also been kind to Carrollton, Texas-based FoxMeyer Corp., the third-largest drug wholesaler in the nation. While most competitors are being squeezed, FoxMeyer's profits are up.

At the close of FoxMeyer's '92 fiscal year in March (a year in which FoxMeyer lost its hefty Kmart account), sales were up to $3.1 billion, a 6.9% jump from 1991.

FoxMeyer is migrating from midsize Unisys Corp. systems to IBM mainframes and has outsourced its IBM Enterprise System/9000-based data center to IBM. To reduce operating costs, FoxMeyer uses robotic picking devices and conveyor systems for some warehousing operations. FoxMeyer also reportedly leads its industry in EDI use, doing business electronically with more than 300 trading partners.

PHOTOGRAPHY BY ROBERT E. DAEMMRICH/TONY STONE WORLDWIDE

The Premier 100

DEFINING REALITIES

BUDGETS
Although not historically big technology spenders, retailers and wholesalers are spending aggressively right now. Almost three quarters of the companies reported an IS budget increase last year. More than half expect one next year.

PRESSURES
With more budget dollars, IS managers are under increased scrutiny. Targeted IS investments are the key to winning management's approval.

ORGANIZATIONAL CHANGES
This industry has had the smallest incidence of data center consolidation. However, almost three quarters have plans to consolidate in the coming year.

5 Dillard Department Stores, Inc.

Dillard Department Stores in Little Rock, Ark., began computerizing operations in the 1960s. With sales and earnings continuing in a strong upward direction, the company remains a firm advocate of the importance of information systems.

"We've got computers, EDI, data capture tools — all the latest and greatest technology," says Ray Heflin, Dillard's director of quick response. The company has already reaped many of the benefits that quick response systems can provide: the ability to replenish goods more quickly, greater turns on inventory, increased sales and fewer price markdowns.

Now Dillard is embarking on a campaign to persuade suppliers to adopt just-in-time manufacturing.

6 Kmart Corp.

Discount retailers can't afford to be cheap. Troy, Mich.-based Kmart, the nation's second-largest retailer, has spent more than $1 billion on information techology since 1985 and is spending nearly $3 billion to refurbish its stores. It has plenty to show for the investment: Profits grew 14% to $859 million last year.

In the IS arena, Kmart has adopted the latest in quick-response technology: UPC bar-code marking and scanning, shipping container marking and reading and an EDI program involving more than 2,000 vendors.

This year, Kmart is equipping its 2,300 stores with handheld spread-spectrum RF devices that will not only speed price checks but also automatically trigger reorders and inventory updates.

7 Bergen Brunswig Corp.

"We don't make products; we distribute others' products," Bergen Brunswig's Chief Information Officer Denny Steele says. "The more efficiently we do that, the more competitive pricing we can offer and the more business we get."

The $4.9 billion Orange, Calif., company operates 31 distribution centers with just 3,000 employees, 195 of whom are in IS, Steele says. In a major organizational shift during the past year, system developers were moved to the functional departments — marketing, warehouse operations, sales and finance.

The company's $20 million IS budget is about 5% higher than last year. The extra money is pegged to enhance efficiencies at the warehouse level, adding automated replenishment systems to the distributor's automated picking capabilities.

8 Winn-Dixie Stores, Inc.

Winn-Dixie Stores is making a comeback. After falling off the pace in the mid-1980s and losing market share to relative newcomers such as Albertson's, Inc., the Sun Belt's largest food chain is introducing bigger, brighter supermarkets and more efficient systems.

Still behind the technology curve relative to some of its competitors, the Jacksonville, Fla.-based company is quickly coming up to speed.

By late June, Winn-Dixie had installed new minicomputers in its 1,200 supermarkets in the U.S. and the Bahamas. The minicomputers will support computer-assisted ordering as well as time and attendance scheduling, according to Jack Russo, a retail food analyst at St. Louis-based A. G. Edwards.

9 Toys R Us, Inc.

Toys R Us has pretty much eliminated all the major competition in its own league. The Paramus, N.J.-based retailer, which controls more than 20% of the domestic toy market, will open 100 new stores around the world this year, while Child World and Lionel's Kiddie City are no longer competitive.

The real games may be just beginning, however. Some big mart kids — Wal-Mart, Kmart and Dayton Hudson Corp.'s Target stores — are moving into the neighborhood and challenging the $6.12 billion specialty chain.

Toys R Us won't be caught short in IS. To provide for growing bandwidth needs, it is upgrading networking capabilities and testing a new Hughes Aircraft Co. satellite — the first to carry an Ethernet wide-area network — that will link 200 of its more than 800 Toys R Us and Kids R Us stores by year's end. A new data center in New Jersey will house a variety of satellite earth stations.

10 Nordstrom, Inc.

California has been taking it no the chin in this recession, and Seattle-based Nordstrom, which does about half its business there, has felt the impact. But rather than simply waiting out the situation, Nordstrom is using IS to buttress its position.

With a budget of $25 million, its IS group set out to improve the quality of inventory information. The result was a prototype item inventory system — installed in Oregon in May — that uses handheld, remote RF scanning devices to help buyers determine which items are selling well.

In addition, a new VIP Express electronic-mail system allows suppliers to communicate with Nordstrom's geographically scattered buyers via MCI Mail.

The system will allow buyers and suppliers to exchange shipping data and check the payment of invoices. ■

Juneau is a free-lance writer and editor based in Salem, Mass.

The name of the game is revenue generation

With the right systems, information can be a money-maker

BY JULIA KING

Over the past few years, almost anything that could go wrong has gone wrong in the transportation industry. Airlines, already staggered by fuel cost increases and loss of business during and after the 1991 Persian Gulf war, are now bloodying one another in cutthroat fare wars. Trucking firms struggle to differentiate their services in a sector reeling with capacity overload.

Industrywide, all companies are up against brutal competitive pressures as old business boundaries disappear and previously distinct businesses move into one another's sectors.

In response, transportatioo firms are looking to information systems for fresh sources of revenue.

Airline, trucking and express package delivery companies have all created informatioo-intensive businesses specializing in shipping logistics. These enterprises — based in large part on sophisticated electronic data interchange (EDI) networks — book air, land, sea and rail transport, handle shipment tracking and, in some cases, manage warehousing and inventory functions for corporate customers.

One major player is AMR Corp., the parent company of American Airlines, which partnered with rail giant CSX Corp. and the Postal Telephone and Telegraph authorities in the Netherlands to create what Max Hopper, senior vice president of information technology, calls "a Sabre system for the cargo world."

INDUSTRY LEADERS

1. **Max D. Hopper**
   Senior V.P., IS
   AMR Corp.
2. **David A. Billings**
   V.P., Information and Technology Systems
   Airborne Freight Corp.
3. **Jerry Long**
   V.P., Summit IS
   Roadway Services, Inc.
4. **Barry Kotar**
   Senior V.P., IS
   Northwest Airlines
5. **Larry Davenport**
   V.P.
   J. B. Hunt Transport Services, Inc.
6. **Wayne Nixon**
   Director, IS
   International Shipholding Corp.
7. **Dennis Jones**
   Senior V.P.
   Federal Express Corp.
8. **Frank Quirit**
   Director, IS
   Hawaiian Airlines
9. **John Wm. Rudasill**
   President, Carrier Computer Services
   Caroline Freight Corp.
10. **Dan Hay**
    V.P., Systems
    Southwest Airlines

1 AMR Corp.

Fort Worth, Texas-based AMR is responding to the economic crisis facing all passenger carriers with a two-pronged strategy of continued large-scale investment in long-term technology projects and deep cost cuts affecting virtually every in-place system and service. Moreover, to help stem a 1991 loss of $241 million, all oew IS projects — including this year's multimillion dollar sales force automation effort — have beeo placed under an immediate 100% return-oo-investment mandate.

On the investment side, there is not only AMR's partnership stake in Encompass, the multibillion-dollar, EDI-based, multimodal cargo shipping logistics system but also its ambitious InterAAct office automation system. InterAAct will link 70,000 employees on personal computers and local-area networks over a single network, with access to all company databases and electronic services.

InterAAct is expected to reduce costs by eliminating redundancies, but AMR has also introduced more direct cost-cutting measures. Lower prices are being negotiated oo all computer purchase and maintenance contracts. Applications are bought rather than built whenever possible. IS staffing has beeo reduced on some projects, and other projects have been eliminated altogether.

The Premier 100

2 Airborne Freight Corp.

EDI-based shipping, invoicing and payment systems shaved 8 cents from Airborne's average cost per shipment in 1992, bringing it down to 36 cents. Meanwhile, total shipping volume for the company, more commonly known as Airborne Express, increased 24%, with 45% of all shipments tendered electronically via the company's Linkage and Libra systems.

Linkage connects the shipping systems of high-volume customers to Airborne's mainframe. Libra combines EDI with PCs, scales and printers so that customers can electronically weigh freight, calculate rates and print shipping labels. This year, Airborne introduced a PC-based software product that allows customers to generate their own invoices.

3 Roadway Services, Inc.

Akron, Ohio-based Summit Information Systems, the IS subsidiary of $3.1 billion Roadway Services, has concentrated most of its efforts this year on two systems that were designed to answer customer demand for up-to-the-minute shipping information.

One is an automated data collection system that uses 5,000 bar-code scanning terminals to track individual cartons. The other is the Roadway Advanced Planning for Inbound Dispatch system, a desktop shipment information management system that provides customers of the less-than-full truckload carrier with real-time data on all shipments.

Summit's next step is to equip drivers of the company's 37,000 trucks with handheld devices to record information at the time of pickup and therefore eliminate as much as an hour's delay in information availability.

CHALLENGES

- Personnel/Human resources
- Process improvement

KEY TECHNOLOGIES

NOW
- On-line customer service
- Shipping tracking systems
- Networks

NEXT FIVE YEARS
- Open systems
- Client/server systems
- Pen-based PCs

4 Northwest Airlines

Northwest Airlines grabbed headlines earlier this year when it introduced Worldlink, the first in-flight communication system providing passengers with video-based entertainment and shopping services. But the bulk of IS work at the privately held airline has been behind the scenes — platform downsizing and re-engineering for open systems.

So far this year, Northwest has invested in Unix-based applications to run on a Sybase, Inc. engine over LANs. New applications include systems for gate management, pilot and route scheduling and pricing.

Continued on page 46

AMR's MAX HOPPER *balances economics and strategic imperatives*

PHOTOGRAPHY BY DAN BRYANT

I own four toasters.

One for rye.
One for wheat.
One for grain.
One for pumpernickle.

I own five ovens.

One for ham.
One for turkey.
One for chicken.
One for lamb.
And one for roast beef.

©1992 Sun Microsystems, Inc Sun, Sun Microsystems, and the Sun logo are trademarks or registered trademarks of Sun Microsystems, Inc All SPARC trademarks, including the SCD Compliant logo, are trademarks or registered trademarks of SPARC International, Inc SPARCstation is licensed exclusively to Sun Microsystems, Inc Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc All other products or service names mentioned hereto are trademarks or registered trademarks of their respective owners

If this sounds like your corporate computing department, maybe we should talk.

Look around your computer department. How maoy mioicomputers have you inherited? And how well are they working together?

May we nffer a simple suggestinn to set things straight?

Integrate them with a Sun™ client-server platform. Sun not only connects what you have in place already, but will connect with what you'll add in the future, too.

Sun servers and workstations coexist peacefully with your mainframes, PCs and servers, no matter what their operating system. Sun is truly open.

And every Suo computet, whether workstation nr server, is built on a RISC-based architecture that scales from laptop to supercomputer. So system building from the desktop to the mainframe is simple, modular and coherent. Your software even stays the same, so you waste no time rewritiog.

What's more, individual Sun products, whether workstation or server, are themselves designed to grow as you need more power. You simply plug in a SPARC™ module as the need arises.

The result: An information technology orgaoization that you can tie together once and for all, built on a platform you can grow with once and for all.

And, surprisingly, you can begin with workstations priced at under $5,000.

To see how other corporations have done it, and how much they have saved with Sun client-server computing, call 1-800-426-5321, ext. 500.

Sun

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc. Business

Continued from page 43

Although the major impetus for architectural changes has been customer service, Northwest is also positioning itself for targeted expansion into international markets. This year's transfer of mainframe-based financial data to LANs was a key step, permitting faster and more accurate projection of demand for seats and routes.

5 J. B. Hunt Transport Services, Inc.

The main thrust of the 80-member IS team at J. B. Hunt has been supporting the less-than-full truckload carrier's diversification into shipping logistics, flatbed hauling and hazardous waste transport. This year, Hunt's IS department will rewrite 80% of existing application code to accommodate the requirements of these new businesses.

By year's end, the company's 6,000 trucks will also be outfitted with IBM Personal System/2 computers linked to an optimization system that integrates data needed by the carrier, its drivers and customers, and five new partners in the railroad industry. Among other things, says Lawrence G. Davenport, senior vice president of information services, the company hopes that the system's ability to track drivers' routing, refueling and scheduling requests will increase job satisfaction and reduce turnover.

6 International Shipholding Corp.

International Shipholding, or ISC, is the $309 million parent company of four waterborne freight shippers: Central Gulf Lines, Inc., Waterman Steamship Corp., Forest Lines, Inc. and LCI Shipholdings, Inc.

At the end of 1991, ISC had in place contracts that would employ the majority of its fleet for this entire year. But continued economic uncertainty here and abroad makes business forecasting a difficult exercise, according to ISC Chairman Niels W. Johnsen. Approaching the future cautiously, ISC's chief business goals in 1992 are controlling expenses and improving overall efficiency.

DEFINING REALITIES

BUDGETS
Despite poor business conditions, more companies in the transportation field received budget increases than did companies in any other industry.

PRESSURES
The IS focus is on producing revenue in the face of declining customer bases, higher logistics costs and brutal competition.

ORGANIZATIONAL CHANGES
Most of these companies consolidated their data centers in the last year.

PLATFORM CHANGES
Most of these companies plan on installing proprietary systems within the next 12 months.

7 Federal Express Corp.

The showpiece of recent IS efforts at Fedex is its Ramp Management Advisory System (RMAS), which uses Unix-based workstations and expert systems software to track more than 85 inbound and outbound flights daily at the company's major airport hub in Memphis. Fedex considers RMAS the launch point for its planned expansion into networked expert systems. In the meantime, although its IS spending remained flat at $360 million for 1992, the $7.7 billion express shipper has continued its march toward real-time distributed computing, replacing terminals with Unix-based workstations at 1,000 shipping stations. Full conversion will be completed by 1995, according to Jon Riker, vice president of corporate systems development.

8 Hawaiian Airlines

HAL, which operates Hawaiian Airlines, Hawaii's largest airline, and the West Maui Airport are using information systems to regain market share. The strategy — initiated by a group of investors led by Peter Ueberroth and his brother John, who is chief executive officer — calls for deep price cuts and a customer service focus, backed by IBM mainframe applications.

So far, the company has managed to reverse a reputation for late arrival with 98% on-time performance and to build back market share from 33% to 45%.

9 Carolina Freight Corp.

Enhancement of a broad array of value-added shipping information services is the main systems goal at Carolina Freight, or CFC, in Cherryville, N.C.

CFC's IS subsidiary, Carrier Computer Services, Inc., processes more than 165,000 EDI transactions monthly, furnishing high-volume customers with online shipping, invoicing and payment information. Lower-volume customers can access rate and shipment status data via an automated voice-response system. A service dubbed "Caro-Fax" furnishes computer-generated manifests, shipment status reports and other messages directly to customers' fax machines.

These system innovations have given CFC the means to provide customers with more information without increasing customer service staffing.

10 Southwest Airlines

A lean and mean IS strategy is at the heart of $1.3 billion Southwest's sustained success in the regional air transport business. Working with a modest budget — $4.7 million — its 60-member IS team developed several new systems in 1992.

Heading the list is the Southwest Integrated Flight Tracking system, or Swift, which consists of two linked systems. One part is a client/server-based integrated flight operations system that combines data from various radar and weather services and allows Southwest to generate its own real-time flight plans. The other is a real-time aircraft situation display, which permits precision planning of ground service and connecting flight schedules.

Other important systems projects activated this year include a PC-based ticket-by-mail system and a network of Quick-It automated ticketing machines. ■

King is a free-lance technology writer based in Ridley Park, Pa.

Utilities

Betting the farm on technology

In this field, if you're not ahead, you're vulnerable

BY AMY BERNSTEIN

INDUSTRY LEADERS

1. **James L. Zucco Jr.**
   Senior V.P.
   MCI Communications Corp.
2. **Joseph T. Ambrozy**
   V.P., Operations and IS
   Bell Atlantic Corp.
2. **R. Thomas Dwyer**
   V.P., IS
   Carolina Power & Light Co.
4. **M. Enel Wade Jr.**
   CIO
   Southern Co.
5. **Ted G. Dixon**
   V.P., Information Resources
   Northeast Utilities
6. **Mike Fridaus**
   V.P., Customer Service and Information Technology
   Ameritech Corp.
7. **George E. Stubbins**
   V.P., IS
   Duke Power
8. **J. E. Hunter**
   Manager, IS Department
   Baltimore Gas & Electric
8. **Dennis Murphy**
   Director, Corporate IS
   GTE Corp.
10. **W. F. Gui Jr.**
    V.P.
    AT&T

KEY TECHNOLOGIES

NOW
- LAN applications
- Telecommunications
- DBMSs

NEXT FIVE YEARS
- Open systems
- Client/server systems
- LANs

Nearly 10 years ago, when deregulation punctured AT&T's long-distance monopoly, twin challenges — increasing competition and changing consumer demands — loomed before staid Ma Bell. The rules of that game were changing from a world where, in place of unchallenged rate increases, one had to provide better service at the lowest possible cost. Deregulation accelerated those trends.

Today AT&T still retains a healthy 70% share of the long-distance carrier market. But fierce competition has transformed the entire industry into a technology-driven race in which each player must develop and deliver a constant slew of consumer-friendly products and services while relentlessly holding down costs.

Meanwhile, the nation's electric and gas utilities are just coming to grips with their tumultuous era of deregulation. New federal laws make it easier than ever for independent power producers and cogenerators to sell power and/or pipeline transmission capacity directly to consumers for less than the established utilities do.

MCI's ZUCCO *stays ahead of the ongoing rollout of new services*

PHOTOGRAPHY BY KATHERINE LAMBERT

The Premier 100

Not surprisingly, change is triggering massive internal restructuring among utilities as they struggle to move to a market-driven culture and infrastructure. As with telecommunications, technology is the critical enabler for the utilities; it is the engine of corporate reinvention. The utilities are still exploring the mandate that telecommunications firms have been implementing for years: Use technology in every way possible to drive down costs unilaterally while continually improving quality and customer service.

For telecommunications companies, which are further along in the technology-driven restructuring process, the next big push is to develop a client/server architecture that streamlines the flow of information from mainframes to desktops. This allows employees in far-flung offices to more quickly and efficiently retrieve data, such as customer billing records, on demand.

MCI Communications Corp., the *Premier 100*'s No. 1 utility for the fourth consecutive year, has a strong grip on these complex initiatives. The company is committing its substantial information systems resources to everything from virtual private network services to lights-out data center operations.

1 MCI Communications Corp.

The nation's second-largest long-distance carrier performed impressively last year: MCI's earnings nearly doubled; to $522 million, on revenue of $2.16 billion — close to double the industry growth rate for 1991. One of the company's high-profile new products, the Friends & Family program, alone generated more than 5 million new long-distance customers.

No wonder, then, that MCI's IS organization is bucking the industry trend toward flat or downsized resources. In 1992, it had staff increase of 250, to 2,050 total, and a budget increase of 4.5%, to $460 million.

In the works is a move toward "800 portability," whereby toll-free 800 numbers would be owned by customers, not carriers. MCI won't detail strategies but admits to readying billing and reporting systems for an anticipated increase in volume. Rollout is scheduled for March 1993.

DEFINING REALITIES

BUDGETS
Deregulation has unleashed competition among utility companies, resulting in this year's flat budgets.

PRESSURES
New competitive threats range from large customers providing their own services to independent companies offering lower cost products.

ORGANIZATIONAL CHANGES
Almost three quarters of these companies plan to consolidate data center operations in the coming year. Most have a mixture of centralized and decentralized organizations.

PLATFORM CHANGES
Nonproprietary systems are on almost everyone's lists. Three quarters of these companies plan to downsize from larger platforms to smaller ones.

CHALLENGES

- Managing PC/LAN technology
- Delivery of corporate business applications
- Networking

Nearly completed is a new networked customer service system of 7,000 IBM OS/2 licenses and an equal number of Personal System/2 Model 90 workstations.

2 Bell Atlantic Corp.

Bell Atlantic, the third-largest provider of local telephone services, is caught up in an effort to essentially "rebuild everything" by the year 2000, according to Joseph T. Ambrozy, vice president of IS and chief information officer.

System 2000 — a $2 billion, 10-year commitment to boosting productivity and competitiveness — involves rebuilding virtually all front-end applications driving the company. One facet: a new Unix-based application for 6,000 customer service representatives.

3 Carolina Power & Light Co.

Carolina Power & Light's ongoing commitment to total quality management (TQM), now in its sixth year, has deeply affected the way the $2.6 billion utility formulates and implements IS strategy.

A new customer billing system — initiated in 1988 as a result of TQM studies — is slated to go on-line at the end of this year. The new system is expected to yield 25% to 30% improvements in productivity overall. And in the early stages is a new activity-based cost management system that breaks down costs by work effort and project. The DB2-based system should go on-line in late 1993.

4 Southern Co.

Southern, in its best year since 1989, posted a 35% gain in first-quarter earnings over '91. The firm serves 120,000 square miles in the Southeastern U.S. and excels at cutting costs while improving infrastructure.

Case in point: Under CIO M. Euel Wade Jr., Southern has laid 1,400 of 2,500 miles of fiber-optic cable. The completed backbone network will tie far-flung plants to the company's headquarters in Atlanta. By cutting deals with long-haul carriers that use Southern's transmission-line rights-of-way, the utility is saving $75 million in capital expenditures while strengthening vital voice and data systems.

Still in the prototyping stage is a massive geographic mapping and facilities management system that will provide precise information on where and when outages occur.

5 Northeast Utilities

Northeast Utilities (NU), the parent company of New England's largest electric utility system, is scrambling to compete in a deregulatory environment. NU's 378-person IS operation is responding, in part, by building innovative new alliances to improve customer service, tighten operations and achieve new economies of scale.

For example, an unusual agreement with IBM, Northern Telecom, Inc., AT&T and other providers will result in a Caller ID system that enables customer service representatives to capture critical information during a power emergency.

On another front, NU's just-completed

Natural Activity-based Accounting System helps IS track precise project expenditures using IBM's DB2 relational database. NU's partner in the $35 million project was Arthur Andersen & Co.

8 Ameritech Corp.

Ameritech Services, the technology arm of the nation's seventh-largest telephone holding company, is in the midst of an ambitious restructuring effort designed to help the company lower costs and become more market-driven.

The first order of business is linking each of 15 core "business processes" — customer billing, repair, marketing and so on — with the IS people and functions that support them. In this way, the various business units and their IS support teams strive together toward goals such as 24-hour, seven-day customer support.

To support this market-driven strategy, Ameritech has budgeted $150 million this year for new IBM Enterprise System/9000 mainframes, an Open Systems Interconnect data network, an NCR Corp.-based client/server network and four new data centers.

7 Duke Power

The mandate for IS at Duke Power — to help lower the cost of generating electricity — reflects difficult economic times at one of the nation's most efficient utilities.

One major IS initiative involves streamlining centralized telephone service to utility customers after hours. The IS department is developing a suite of applications that make it easier for service representatives to extract customer account data using the customer's phone number rather than a complex customer ID. The new system will enable fewer people to handle more calls.

6 Baltimore Gas & Electric

Despite a 7% cutback in its $65 million IS budget this year, Baltimore Gas & Electric (BG&E) is knee-deep in IS projects. The most important is a wide-area network, budgeted at $2.5 million, that will connect 11 BG&E business locations in Maryland. The data network's open systems architecture should improve local-office access to data and eliminate intraoffice paper trails.

During the next couple of years, the network will support many critical new applications running on multivendor platforms, such as a $7 million customer information analysis system that improves anticipation of emergencies such as residential power outages.

9 GTE Corp.

GTE is the nation's largest local phone company and the second-largest cellular telephone provider, thanks to last year's $6.6 billion merger with Contel Corp. It is also among the most profitable: Local phone traffic grew 8% last year, besting the 2% industry average.

Despite phenomenal growth, GTE's 1992 IS budget of $800 million is about even with last year's, and head count is flat. Roughly 60,000 PCs are in place now, compared with 20,000 three years ago.

Like its rivals, GTE is focusing on building a client/server architecture. A three-year, $150 million agreement with Hewlett-Packard Co. will result in hundreds of new servers and workstations. Once completed, the new architecture will allow GTE to internally publish more than 1,200 telephone directories, a job that is now outsourced. The directories contribute $1.2 billion yearly to GTE revenue.

10 AT&T

Even with 70% of the long-distance market in hand, AT&T isn't taking anything for granted. The company paid $7.4 billion for NCR last year as part of a long-term strategy to make AT&T a one-stop shop for worldwide voice-data networks and attendant equipment.

The acquisition is fueling a major IS push to incorporate NCR's local-area networks and processors into a new client/server architecture that will make it easier for 21 business units and as many supporting divisions to quickly access data locally. For example, individual customer records that once resided on a central mainframe can now be accessed locally.

AT&T views this re-engineering process as essential to speeding up customer service, improving accountability and eliminating the number of people involved in each business transaction.

Overall, AT&T expects savings of 65% to 75% over five years from re-engineering and ongoing data center consolidation efforts — with no planned cutbacks in IS staffing, which hovers around 20,000. ■

Bernstein is a free-lance writer based in Baltimore.

GOOD SERVICE, *supported by IS tracking systems, is a primary goal for utilities*

PHOTOGRAPHY BY DAVID JOEL/TONY STONE WORLDWIDE

Eastman Kodak Company

Major rightsizing, 35 centers
Faster access to information
Improved decision making
Client-server computing with Sun.

©1992 Sun Microsystems, Inc Sun, Sun Microsystems, and the Sun logo are trademarks or registered trademarks of Sun Microsystems, Inc All other products or service names mentioned herein are trademarks or registered trademarks of their respective owners.

One day. That's how long it was taking to get information from the mainframe to customer service representatives in the field.

One day too many for Kodak.

The solution? A Sun™ client-servet system that put information into the hands of its Customer Service Group when they needed it. Any time of the day or night. Thirty-five centers in all.

The hardware? Two Sun servers running database software with data downloaded from an IBM® 3090 mainframe.

Gained: Improved decision making, faster response time, reduced maintenance and support costs, and a system that gives more flexibility to the end user.

It's no wonder that more and more companies are seeing that client-server computing can cut costs, increase competitiveness and position their computing department for the future.

To see how others are doing it, and to find out if it's a direction that's right fot you, call 1-800-426-5321, ext. 500.

Sun

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc. Business

IT'S NOT HOW MUCH YOU READ.

You can read a knee-high stack of computer magazines each month and still not find the depth and breadth of news and information you'll discover each week in the pages of *Computerworld.*

As the only weekly newspaper for IS professionals, *Computerworld* is filled with up-to-the-minute articles on topics ranging from products and people to trends and technology. We cover it all — PCs, workstations, mainframes, client/server computing, networking, communications, open systems, languages, industry news, and more.

It's everything you need to know to get an edge on the competition.

That's why over 135,000 IS professionals pay to subscribe to *Computerworld* every week.

IT'S WHAT YOU READ.

Order *Computerworld* and you'll receive 51 information-packed issues. Plus, you'll receive our special bonus publication, The *Premier 100*, an annual profile of the leading companies using information systems technology.

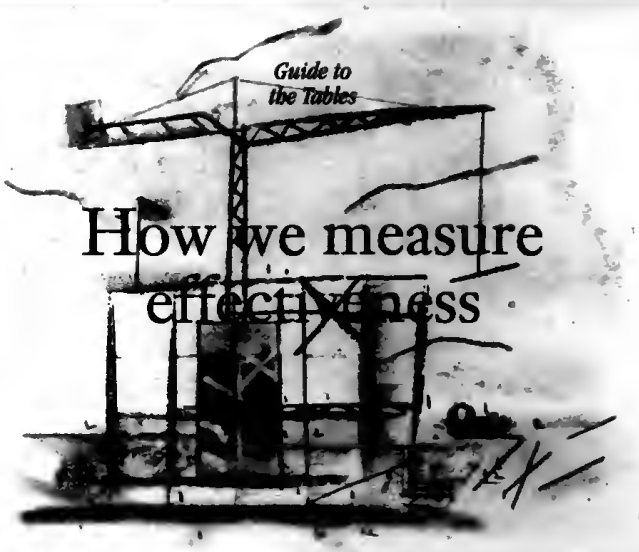
Call us toll-free at 1-800-343-6474. Please refer to code DP1J2-7 when ordering. Or use the postage-paid subscription card bound into this issue. And get your own copy of *Computerworld.*

Then you can spend less time reading about the world of information systems. And more time conquering it.

The Newspaper of IS

Guide to the Tables

How we measure effectiveness



There is no single measure that defines the effective use of information systems by a large company. But it is possible to assess effectiveness based on a broad dimension of measures that balance both the qualitative and quantitative aspects of technology use. *Computerworld*'s *Premier 100* provides this analysis.

Each year since 1988, we have taken the top half of the Fortune 500 industrial and service companies and looked at how they invest in and deploy IS. By combining seven measures, we assess which companies lead their industries in the effective use of IS.

These measures include: 1) assessment of the company's effectiveness, according to its peers; 2) IS budget for that year; 3) company profitability over five years; 4) current market value of major hardware; 5) IS staff expenditures; 6) IS training investments; and 7) the number of personal computers and terminals installed in the company.

A total of 600 companies were included in this year's study. More than 40 specific industry breakdowns were used to calculate the ranking.

Aside from sales and profit information, the data was provided by IS executives at the highest level of each of the companies. In cases where companies did not supply data, *Computerworld* generated estimates by working with consulting and industry sources.

The total points used to rank the companies are the sum of all the points collected in all seven measures. The peer assessment has the highest value (a multiplier of 30). The other measures have an equal value (a multiplier of 15), except for staff (which has a multiplier of 10). Each measure is calculated and ranked separately for all the companies.

Among the best judges of IS effectiveness are the IS executives themselves. For this reason, we have a measure based on how IS executives rank their peers from a list of companies in their industry group. They are asked to select the Top 5 most effective users of information systems in their industry and rank them one to five. The total peer score is based on the combination of all the rankings a company achieves.

How committed is a company to IS? We use an industry comparison of a company's IS budget as a percentage of revenue to answer this question.

This measure takes into account the combined domestic IS spending of the corporation, including subsidiaries. The budget as a percentage of revenue is compared with an average for that company's industry. Above-average budget ratios receive higher points than do below-average ones.

IS staff and training spending are measured as a percentage of the combined corporation budget. Higher training investments receive more points than lower ones to account for the importance of a well-educated IS staff. Lower staff investments receive more points than higher ones to reflect the efficiencies gained from automation.

To reflect the IS contribution to business performance, profit growth is measured after taxes and extraordinary credits over a five-year period. Profits for mutual insurance companies are based on net income. This year's ranking is based on the average percentage for 1987 through 1991.

How current is a company's technology investment? The dollar value of mainframes, minicomputers and supercomputers on today's market is measured as a percentage of revenue to assess this aspect.

One of the IS organization's prime missions is to provide access to technology to employees throughout the corporation. We measure the total number of PCs and terminals as a percentage of total employees to gain a snapshot of how IS answers this mission. The companies with the most PCs and terminals per capita receive the most points. ■

ILLUSTRATION BY JEFF JACKSON

THE 100 MOST EFFECTIVE USERS OF INFORMATION SYSTEMS

1992 Industry rank	Company	Total score	Profit growth 1987-1991	IS budget (millions)	IS budget as % of revenue	Processor market value (millions)
AEROSPACE						
1	The Boeing Co.	65,610	37.7%	$1,600	5.46%	$562.5
2	Grumman Corp.	64,555	30.3%	$153	3.78%	$75
3	McDonnell Douglas Corp.	62,695	13.0%	$683	3.65%	$256
4	Martin Marietta Corp.	62,680	9.3%	$301	4.93%	$94.6
5	Lockheed Corp.	61,595	10.1%	$320	3.26%	$324
6	Raytheon Co.	59,320	7.4%	$105	1.12%	$60
7	Rockwell International Corp.	59,100	(0.5)%	$285	2.37%	$145
8	Textron, Inc.	57,675	4.2%	$169	2.16%	$70
9	Northrop Corp.	57,150	(48.6)%	$243	4.35%	$1.4
10	General Dynamics Corp.*	53,340	(59)%	$350	3.67%	$200
	Industry average	60,372	4%	$421	3.5%	$179
CONSUMER PRODUCTS AND SERVICES						
1	Reader's Digest Association, Inc.	64,220	22.8%	$120	5.01%	$19
2	Procter & Gamble Co.	62,255	37.7%	$236.6	.86%	$48
3	Levi Strauss Associates, Inc.*	61,200	17.0%	$125	2.5%	$15
4	Gillette Co.*	59,780	17.0%	$120	2.5%	$89
5	American Brands, Inc.	59,705	12.3%	$73.5	.86%	$17
6	The Dun & Bradstreet Corp.*	59,650	7.8%	$778	16.6%	$150
7	McGraw-Hill, Inc.*	59,345	6.1%	$166	8.54%	$100
8	Helene Curtis Industries, Inc.	59,000	(13)%	$30	3.36%	$12
9	Humana, Inc.	58,825	16.6%	$90	1.53%	$100
10	Johnson Controls, Inc.	58,675	2.8%	$60	1.31%	$7
	Industry average	60,266	12.6%	$180	4.3%	$56
FINANCIAL SERVICES						
1	J. P. Morgan & Co.	64,435	30.8%	$510	4.94%	$65
2	Primerica Corp.	63,890	59.0%	$293.1	4.43%	$55
3	Banc One Corp.	63,650	27.8%	$293	7.1%	$79
4	CoreStates Financial Corp.	63,475	23.0%	$103	4.32%	$24
5	KeyCorp	63,355	24.8%	$48.7	2.10%	$17.3

Listings continue on the following page

*Estimates are from *Computerworld* sources and not the companies

Market value as % of revenue	% of IS budget for staff	% of IS budget for training	Total PCs and terminals	% of employees with PCs/terminals	Company highlights
1.92%	53%	2%	122,600	77%	Bucks trend: 23% budget increase
1.66%	45%	3%	18,250	77%	Networking emphasis brings efficiency
1.37%	45.9%	2.5%	75,400	69%	Cut five data centers; added 5,400 PCs
1.55%	21%	1%	23,700	39%	Server strategy increases productivity
3.3%	41%	1%	45,000	62%	Up to 30% savings from recentralization
.64%	40%	1%	34,000	47%	Emphasis on imaging, paperless design
1.21%	52%	4%	59,000	68%	NASA contractor ups IS budget 10%
.89%	41%	6%	25,500	49%	Nets 6% profit rise; IS focus: TQM
.02%	49.6%	2%	23,900	60%	IS consolidations save $25 million
2.09%	53%	1%	7,600	9%	$3 billion CSC outsourcing contract
1.4%	44%	2%	43,500	56%	
.79%	45%	3%	4,589	62%	Global drive; $22 million budget rise
.18%	38.3%	2.2%	48,000	46%	Close customer links; brand focus
.31%	44%	3%	4,000	12%	IS links Levi value chain with EDI
1.89%	50%	5%	9,000	29%	Global strategy requires flexible IS
2%	45%	2%	10,000	20%	Balances business unit, central IS
3.5%	45%	3%	50,000	86%	Emphasizing lower cost IS services
5.1%	42%	3%	5,000	37%	Client/server rollouts; 15 business units
1.35%	39.7%	3.1%	3,600	100%	Customer drive fuels 10% budget rise
1.69%	45%	1%	18,000	20%	1992 initiatives: imaging, LANs
.15%	42%	2%	11,000	29%	Even budget; IS focus: Customer service
1.5%	44%	2.7%	16,319	46%	
.63%	36%	1%	12,500	95%	Profits up 44%; IS focus: Desktop Unix
.88%	31%	4%	18,100	72%	Income up 26%; highly decentralized IS
1.9%	30.7%	4%	29,500	100%	IS effort aides most profitable year ever
1.01%	36%	1.6%	10,500	78%	Even spending; 30% business growth
.77%	36%	.5%	13,894	100%	IS keys acquisitions; budget up $8 million

THE 100 MOST EFFECTIVE USERS OF INFORMATION SYSTEMS

1992 industry rank	Company	Total score	Profit growth 1987-1991	IS budget (millions)	IS budget as % of revenue	Processor market value (millions)
FINANCIAL SERVICES						
6	BankAmerica Corp.*	63,205	1.9%	$700	5.71%	$93.7
7	Barnett Banks, Inc.	63,125	13.3%	$142	4.34%	$30
8	Unum Life Insurance Co.	61,685	21.9%	$82.5	3.82%	$9
9	Bankers Trust New York Corp.	61,580	(25)%	$435	6.36%	$70
10	Massachusetts Mutual Life Insurance Co.	61,420	20.3%	$70	1.04%	$9
	Industry average	62,982	19.8%	$269	4.4%	$45.5
INDUSTRIAL AND AUTOMOTIVE PRODUCTS						
1	Dresser Industries, Inc.	61,115	28.4%	$116	2.47%	$30
2	Black & Decker Corp.	60,390	22.7%	$80	1.73%	$40
3	Caterpillar, Inc.	59,235	(39.4)%	$346.1	3.4%	$191.5
4	Harley-Davidson, Inc.	58,910	21.3%	$7	.74%	$6
5	Eaton Corp.	58,595	(17.2)%	$76	2.1%	$30
6	Ford Motor Co.*	58,205	(44)%	$1,330	1.5%	$400
7	Deere & Co.	58,005	7.25%	$202.3	2.87%	$125
8	Paccar, Inc.*	57,890	1.75%	$40	1.7%	$20
9	Trinity Industries, Inc.*	57,365	51.1%	$15	1.2%	$6
10	Ingersoll-Rand Co.*	56,945	9.1%	$40	1.67%	$16
	Industry average	58,665	4.1%	$227	1.9%	$87.3
MANUFACTURING						
1	Kimberly-Clark Corp.	62,410	19.1%	$116	1.7%	$32
2	Corning, Inc.	61,910	12.4%	$80	2.43%	$30
2	3M Co.	61,275	6.8%	$310	2.32%	$251
4	Inland Steel Industries, Inc.	60,345	(32.8)%	$60	1.76%	$8.6
5	Cone Mills Corp.*	60,130	12.0%	$10	1.43%	$7
6	Annealing Co.*	59,675	49.0%	$18	1.45%	$10
7	Eastman Kodak Co.*	59,430	(27.0)%	$518	2.64%	$50
8	Sonoco Products Co.	59,255	14.2%	$9	.53%	$.5
9	Polaroid Corp.	58,955	(24)%	$67	3.2%	$39
10	Bethlehem Steel Corp.	58,945	(34.0)%	$82.6	1.91%	$5.4
	Industry average	60,283	(0.4)%	$127	1.9%	$43.4

*Estimates are from *Computerworld* sources and not the companies

Market value as % of revenue	% of IS budget for staff	% of IS budget for training	Total PCs and terminals	% of employees with PCs/terminals	Company highlights
.76%	29%	1.4%	81,000	100%	Swallows $400 million Security Pacific IS
.92%	35%	4%	14,000	79%	$50 million invested in PC/LAN project
.37%	46%	2.5%	5,900	100%	15% IS budget hike backs client/server
1.02%	29%	2.5%	13,000	100%	Strong profits; architecture rewrite
.13%	59%	2%	7,436	76%	OLTP system nets 40% productivity rise
.84%	37%	2.4%	20,583	90%	
.64%	46%	3%	4,000	13%	Uses EDI to shorten order process
.86%	35%	5%	10,000	20%	Focus: Quick response and MRP II systems
1.88%	53.7%	1.4%	30,000	56%	Systems rebuilt for speed/integration
.64%	35%	25%	600	11%	High demand met by new inventory systems
.82%	39%	2%	13,000	36%	Cost containment on a global scale
.45%	52%	5%	70,000	11%	Rebound under way; plant floor systems key
1.77%	42%	1%	18,500	51%	Streamlining yields low-cost production
1.2%	42%	2%	6,000	39%	Diversifying IS throughout truck business
.48%	40%	2%	3,500	36%	Lowest cost rail car producer
.45%	54%	7%	10,000	32%	Migrating from mainframe to AS/400s
.9%	44%	5%	16,360	32%	
.47%	36%	3%	16,400	40%	Major IS initiatives across the board
.91%	50%	4%	9,000	29%	Internal operations revamp with TQM
1.88%	55%	6%	47,000	53%	Replaced midrange with PCs/servers
.25%	47%	.8%	6,306	34%	Open systems, paper reduction emphasis
1%	42%	2%	6,000	43%	Internal systems shift to real time
.8%	45%	5%	3,000	17%	Fieldcrest Cannon plant modernization
.25%	40%	2.5%	75,000	56%	IBM outsourcing, integration reduce costs
.03%	42%	4%	1,200	9%	Shift to global supplier yields new systems
1.86%	56%	3.5%	6,000	50%	IS integrates applications
.13%	67%	1.3%	7,600	28%	Data mining, networks speed business
.76%	48%	3.4%	17,751	36%	

THE 100 MOST EFFECTIVE USERS OF INFORMATION SYSTEMS

1992 industry rank	Company	Total score	Profit growth 1987-1991	IS budget (millions)	IS budget as % of revenue	Processor market value (millions)
PETROLEUM AND CHEMICALS						
1	Phillips Petroleum Co.	62.965	16.8%	$183	1.45%	$21.7
2	The Dow Chemical Co.	61.590	5.3%	$400	2.07%	$122.7
3	FMC Corp	61.350	(0.8)%	$118	3%	$40
4	Unocal Corp.	61.255	6.5%	$178	1.82%	$46
5	Union Texas Petroleum Holdings, Inc.*	60.360	55.2%	$6	.56%	$5
6	Monsanto Co.	60.115	(3.8)%	$185	2.07%	$140
7	Ashland Oil, Inc.	59.580	21.5%	$76	.82%	$4.5
8	Rohm and Haas Co.	59.080	(2.3)%	$98	3.53%	$21
9	NERCO, Inc.	59.040	8.75%	$10.3	1.12%	$4.8
10	Air Products and Chemicals, Inc.*	58.755	15.1%	$51	1.73%	$10
	Industry average	60.409	12.29%	$130.5	1.8%	$41.6
PHARMACEUTICALS AND FOOD						
1	Merck & Co.	63.135	23.8%	$160	1.86%	$120
2	Schering-Plough Corp.	61.820	19.5%	$67	1.82%	$20
3	Becton, Dickinson & Co.	61.685	6.4%	$57.7	2.66%	$25
4	Sara Lee Corp.	61.535	19.7%	$137.7	1.11%	$24.6
5	International Multifoods Corp.	61.275	(4.8)%	$11	.5%	$4
6	Pepsico, Inc.	60.920	16.5%	$350	1.77%	$50
7	Bristol-Myers Squibb Co.*	59.375	31.2%	$209	1.35%	$80
8	Upjohn Co.*	59.270	17.1%	$57	1.53%	$30
9	Abbott Laboratories*	59.175	14.6%	$170	2.46%	$28
10	Johnson & Johnson*	59.030	15.4%	$231	1.86%	$70
	Industry average	60.722	15.9%	$145	1.75%	$45.2
RETAILING AND WHOLESALING						
1	Wal-Mart Stores, Inc.*	62.640	17.5%	$335	.76%	$96
2	Sears, Roebuck and Co.	62.435	5.7%	$1,233	2.15%	$637
3	The Home Depot, Inc.	62.110	46.6%	$42	.82%	$15
4	FoxMeyer Corp.	60.425	7.8%	$44	1.46%	$4
5	Dillard Department Stores, Inc.*	60.325	22.8%	$29	.69%	$5.8

Listings continue on the following page

*Estimates are from *Computerworld* sources and not the companies

Market value as % of revenue	% of IS budget for staff	% of IS budget for training	Total PCs and terminals	% of employees with PCs/terminals	Company highlights
.17%	43.5%	.93%	14,265	63%	Major shift: Mainframe to workstations
.64%	37%	10%	32,000	57%	Rebuilt integrated financial/order systems
1.02%	37%	7%	11,400	49%	Profit up 6%; WAN/workstation projects
.47%	34%	2.3%	9,860	57%	Multimedia training; major downsizing
.47%	37%	1%	300	29%	Half the size; twice the profit
1.57%	38%	4%	15,000	36%	10% budget hike; global decision support
.05%	32%	3%	8,300	28%	Single shared data center; divisional PCs
.76%	36%	1.2%	6,600	51%	$10 million project: On-time product delivery
.52%	29%	1%	650	36%	Profits up 4%; downsize to open systems
.34%	43%	3.7%	6,500	45%	8% profit rise; decentralizing IS duties
.60%	36.7%	3.4%	10,486	45%	
1.39%	50%	6%	15,000	40%	Profit up 19%, new CIO, supercomputer
.54%	31%	2.5%	5,000	25%	14% more profits; 10% more IS spending
1.15%	46.3%	5.9%	8,719	47%	16% budget hike; network rollout
.2%	45%	4.5%	30,000	27%	Mission-critical PCs replace mainframe
.18%	36%	1%	1,500	16%	39% profit jump; solid IS investments
.25%	35%	3%	32,000	9%	Empowering through IS; most revenue
.71%	48%	2%	24,000	45%	Profits up 18%; focus on IS efficiency
.86%	50%	4%	6,500	34%	IS aim: Internal marketing; 18% profit rise
.4%	52%	1%	15,000	33%	13% more income; automated purchasing
.56%	46%	5%	15,000	18%	Profits up 28%; IS planning global video
.62%	44%	3.5%	15,272	29%	
.22%	41%	1%	77,360	21%	24% profit rise; low-cost EDI leader
1.2%	40%	3%	350,000	78%	Profits up 42%; budget up 5%
.29%	44%	1%	3,000	10%	Growth boosts mainframe capacity 50%
.13%	50%	1%	3,000	29%	IBM outsourcing, warehouse robotics
.14%	43%	3%	4,000	12.4%	10% profit rise; focus on quick response

THE 100 MOST EFFECTIVE USERS OF INFORMATION SYSTEMS

1992 industry rank	Company	Total score	Profit growth 1987-1991	IS budget (millions)	IS budget as % of revenue	Processor market value (millions)
RETAILING AND WHOLESALING						
6	Kmart Corp.	60,290	17.5%	$215.2	.62%	$57
7	Bergen Brunswig Corp.	59,335	38.6%	$20	.4%	$16
8	Winn-Dixie Stores, Inc.*	59,085	11.2%	$98	.97%	$50
9	Toys R Us, Inc.*	58,715	14.2%	$49	.80%	$12
10	Nordstrom, Inc.	58,705	10.9%	$25.2	.79%	$3.8
	Industry average	60,407	19.3%	$209	.95%	$94.7
TRANSPORTATION						
1	AMR Corp.	66,895	23.9%	$1,090.8	8.4%	$79
2	Airborne Freight Corp.	64,425	45.9%	$55	4.02%	$6
3	Roadway Services, Inc.	63,405	27.4%	$93.9	2.96%	$53.4
4	Northwest Airlines	61,645	32.8%	$205	2.7%	$47
5	J. B. Hunt Transport Services, Inc.*	61,170	2.7%	$15	2%	$6
6	International Shipholding Corp.*	60,415	(.2)%	$12	3.65%	$3
7	Federal Express Corp.	60,130	(28)%	$360	4.7%	$150
8	Hawaiian Airlines*	59,855	(70)%	$12	3.26%	$6
9	Carolina Freight Corp.	59,810	(1.5)%	$13.7	1.78%	$20
10	Southwest Airlines*	59,450	11.6%	$4.7	.36%	$3
	Industry average	62,020	4.5%	$186.2	3.4%	$37
UTILITIES						
1	MCI Communications Corp.	64,460	49.8%	$460	5.45%	$330
2	Bell Atlantic Corp.	63,975	2.9%	$750	6.11%	$553
3	Carolina Power & Light Co.	63,855	12.2%	$75	2.76%	$25
4	Southern Co.	62,345	17.3%	$200	2.48%	$16
5	Northeast Utilities	62,075	1.3%	$72.8	2.64%	$97
6	Ameritech Corp.	61,290	(0.4)%	$560.5	5.18%	$129
7	Duke Power	61,190	4.4%	$76.6	2.01%	$13
8	Baltimore Gas & Electric	59,730	(5.3)%	$62.9	2.56%	$75
9	GTE Corp.*	59,500	9.1%	$800	3.6%	$140
10	AT&T	59,480	(69.9)%	$2,900	4.5%	$900
	Industry average	61,790	2.1%	$595.8	3.8%	$227.8

*Estimates are from *Computerworld* sources and not the companies

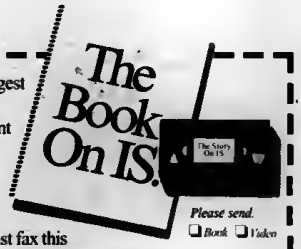
Market value as % of revenue	% of IS budget for staff	% of IS budget for training	Total PCs and terminals	% of employees with PCs/terminals	Company highlights
.16%	39.6%	.72%	106,348	31%	Profits up 14%; radio-frequency terminals
.33%	52%	5%	2,700	73%	5% budget hike; development decentralized
.49%	37%	5%	30,000	28%	1,200 new in-store minicomputers added
.20%	45%	5%	4,000	10%	4% profit rise; Ethernet satellite system
.12%	45%	2.96%	910	3%	17% more net income; supplier E-mail
.33%	44%	2.2%	56,332	29%	
.61%	27.6%	.3%	117,869	100%	100% ROI required for new IS projects
.44%	35%	.8%	8,700	6%	Even spending, more EDI services
1.68%	37%	1.7%	15,650	43%	17% budget rise; desktop/handheld PCs
.62%	32%	1%	3,000	79%	Focus: Unix applications; in-flight network
1%	42%	4%	2,000	21%	Rewriting 80% of its application code
.91%	41%	2%	600	77%	Goals: Improve efficiency, control expense
2%	48%	3%	60,000	73%	Even budget; innovative flight tracking
1.64%	42%	2%	1,000	37%	Focus: Cost reduction; efficiency
2.6%	34%	2%	1,400	13%	EDI customer applications save staff costs
.23%	44%	3%	1,100	10%	Budget up 15%; flight operations system
.97%	38%	2%	21,134	36%	
3.91%	46%	6%	34,000	100%	Nearly twice the earnings; 4.5% budget hike
4.5%	37%	5.1%	70,000	92%	Budget part of $2 billion, 10-year IS revamp
.92%	37%	4%	6,500	78%	25% productivity boost from TQM system
.2%	40%	1%	18,000	59%	Flat budget; extensive fiber-optic backbone
3.52%	46.5%	4.8%	6,253	77%	Profits up 12%; $35 million tracking system
1.19%	42%	1.5%	66,000	89%	Four new data centers worth $150 million
.34%	44%	3.5%	13,000	67%	Cost savings through internal IS investment
3.05%	59.2%	1.3%	5,000	52%	$2.5 million WAN; $7 million project
.64%	37%	5%	60,000	37%	Three-year $150 million client/server plan
1.4%	45%	6%	315,000	99%	65% savings projected NCR-based migration
1.97%	45.4%	3.8%	59,375	75%	

We left out everything in this ad except what was important to you.

Information Systems is the largest computer market in the world. Computerworld readers account for *$81 billion* of it.

And we thought that might be important to you.

To learn more, ask for our book and video all about IS. Just fax this coupon to 1-508-879-0446, or mail it to the address below.



Please send.
❑ *Book* ❑ *Video*

Name *Company*

Address

City *State* *Zip*

Phone

©1992 Computerworld, Dept. P1 375 Cochituate Rd., Framingham, MA 01701-9171 An IDG Company.

COMPUTERWORLD
The Newspaper of Information Systems.

(Clip-out and fax or mail)

The Last Word

Do you have what it takes?

BY DUWAYNE PETERSON

I haven't met all the IS executives honored in *Computerworld*'s *Premier 100*, but I do know several things about them. I know that they work hard and that they aren't inclined to rest on their laurels.

It couldn't be otherwise: Using information systems effectively is a job that never ends. The first condition for effectiveness is credibility. Before an IS organization can even hope to make a real difference, it must earn the trust of everyone from top executives to business unit staffers.

Another condition for effectiveness, which is very close to credibility, is relevance to the business. This cannot be taken for granted. Business priorities are changing rapidly, and an IS organization that hopes to stay relevant has to be able to keep up a stiff pace, adapt easily and rise to fresh challenges as quickly as they appear.

That's not all it takes to be an effective user of information systems. Here are some of the other major requirements:

- Close coordination between strategic business planning and IS planning.
- Effective IS management processes and performance measurement.
- A well-conceived and well-constructed infrastructure.
- Process change that is more than automation.
- Effective human resource management.

Integration of strategic business planning and IS planning has been talked about for so long that many people take it for granted. But the reality is that it still does not happen in most organizations. Without this integration, there is no way for IS to be effective because it is a rudderless ship groping for direction.

For its part, the IS organization must have the management capability to operate within the planning process and provide value to the total business plan. IS must have a solid vision of its own role in achieving the plan's objectives.

Getting from wherever you are to wherever you need to be always demands some kind of infrastructure. In the case of IS, you need systems architecture, data management, system tools and standards. Your architecture must include not only how computing is accomplished — on a mainframe, in client/sever mode and so on — but how information is integrated across the organization and how the IS function is structured to support computing activities.

The major task is to figure out how to structure IS resources to best accommodate two ongoing requirements: low-cost, highly responsive services across the organization and individualized services that can be identified and directed by business units. There is no formula for how much of any organization's IS resources should be integrated or dedicated; the key is to address the issue and not be trapped by too narrow an approach such as one that is either all centralized or all decentralized.

Another major part of systems architecture is the network strategy. Organizations are providing increased interoperability among internal organizations, customers and suppliers. The IS groups that have established the proper infrastructure and are focusing on the network will be positioned to exploit these new capabilities.

A flexible and responsive infrastructure sets the stage for effective process change, which is where the real benefits are delivered. The concept of business process re-engineering may be an overworked term, but it is a major part of delivering maximum benefit. We simply can't afford to continue automating inefficient business processes.

The best way to achieve process improvement is through a strong partnership with the business organization. It is critical that key processes are examined, challenged, revised or eliminated.

The final, and possibly most important, issue is human resource management. Without a skilled, well-trained work force, none of these things is possible. ■

Peterson, former CIO of Merrill Lynch & Co., heads DuWayne Peterson Associates, an IS consultancy.

PHOTOGRAPHY BY ALAN LEVENSON

16,000 experts
500,000 clients
125 countries

A Fortune 500 company?

©1992 Sun Microsystems, Inc. Sun, Sun Microsystems, and the Sun logo are trademarks or registered trademarks of Sun Microsystems, Inc. All other products or service names mentioned herein are trademarks or registered trademarks of their respective owners.

Actually, it's Sun's Customer Support.

These days, the most impressive performance isn't just inside your Sun™ computer. It's behind your Sun computer, too, with Sun Customet Support.

Sixteen thousand experts in 125 countries suppott more than 500,000 UNIX® systems, making Sun the world's largest installet and supporter of UNIX-based clieot-server systems.

As a Sun customer you'll draw from 65 traioing centers and 24 answet centers for hardware, software, and network support. Easy to use support tools, such as AnswerBook, SunSolve and HelpDesk are available. And because Sun products have upgrade paths built right in, our experts can help you plan fot the future right from the start.

How well have we met your needs?

Recently Sun was awarded a 94 perceot loyalty tating from amoog Sun customers — significantly higher thao the industry average. And Sun Customet Support has helped to make the cost of owniog Suo among the lowest 10 the industry.

But as for how satisfied we are? Well, we're still working on that 6 percent.

Sun

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc. Business

When you see the words "heroes of the computer revolution" who do you think of?

Think again.

The biggest heroes in computing these days are people like you, who have found smart, innovative ways to use computers.

And what do you have to show for your boldness? You have made your companies more competitive by finding innovative ways to use information.

By listening to people like you, we at Sun™ will learn to deliver better and better ideas.

After all, our industry is still young. Who knows how far you can take it.

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc. Business

©1992 Sun Microsystems, Inc. Sun is a trademark of Sun Microsystems, Inc.

If They Have A Computer On Board We Can Talk To 'Em.

From supercomputers to networks of networks, interoffice or intercontinental, Cisco routers connect them all. With the world's largest installed base, and our flexible, software-driven technology, we have the products and experience to solve even the toughest internetworking problems. So call us at 1-800-859-2726. You'll see why, with Cisco routers, nothing's impossible.

[redacted]

CISCO SYSTEMS

© 1992 Cisco Systems, Inc. All rights reserved.

Informix Database Technology Helps The Seattle Seahawks Score Big In The NFL.

When the NFL's Seattle Seahawks wanted quick access to information that would help them make better competitive decisions, they turned to us, Informix, the experts in UNIX relational database technology.

A Strategic Move To UNIX.

The Seahawks, a pioneer in bringing sports franchise operations on line, made a decision to move their proprietary database to a flexible UNIX system. The new system had to store and track vast amounts of data, including statistics on virtually every football player on a college or professional level worldwide. The system had to be technically sophisticated, comprehensive, and easy to use by front office and coaching staff alike.

The Seattle Seahawks chose the Informix UNIX solution.

Running Operations Throughout The Franchise.

The Informix database tracks player statistics from college through professional football. Seattle scouts use laptops in the field and download their reports directly into the central database over phone lines.

The Seahawks also record and track all injury and treatment records, and analyze individual and team playing tendencies. Accounts payable and receivable are run on an application developed by an Informix VAR. And the Seahawks' newest in-house application is one that tracks all season ticket holder information.

The Seahawks and thousands of other organizations have called on us for 12 years to successfully handle their critical data.

If you're considering UNIX for data management, talk to Informix. Because we're the experts.

Call 1-800-688-IFMX.

INFORMIX®

THE UNIX DATABASE EXPERTS.

© 1992 Informix Software, Inc. Informix is a registered trademark of Informix Software, Inc.
All other names indicated by ® or ™ are registered trademarks or trademarks of their respective manufacturers.